

MINING

CONGRESS JOURNAL

NOVEMBER
1943



A
JOURNAL
for the
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Published
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AMERICAN
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IRONCLAD
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MINING

CONGRESS JOURNAL

VOLUME 29, NUMBER 11

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Cost of Government

Senator Harry F. Byrd, of Virginia, recently pointed out the growing trend of bureaucracy in Federal Government during this war. According to Senator Byrd "Our Federal Government now has more persons on the taxpayer's pay roll than the combined total of all the employes of all the 48 states plus all the employes of all the country's county and municipal governments. In the last war the ratio was one civilian government employe to five soldiers. The ratio now is one civilian employe to two and one-half soldiers."

And now we have the largest army in the history of the nation.

FRONT COVER: Olga No. 2 shaft of the Carter Coal Co., Coalwood, W. Va.

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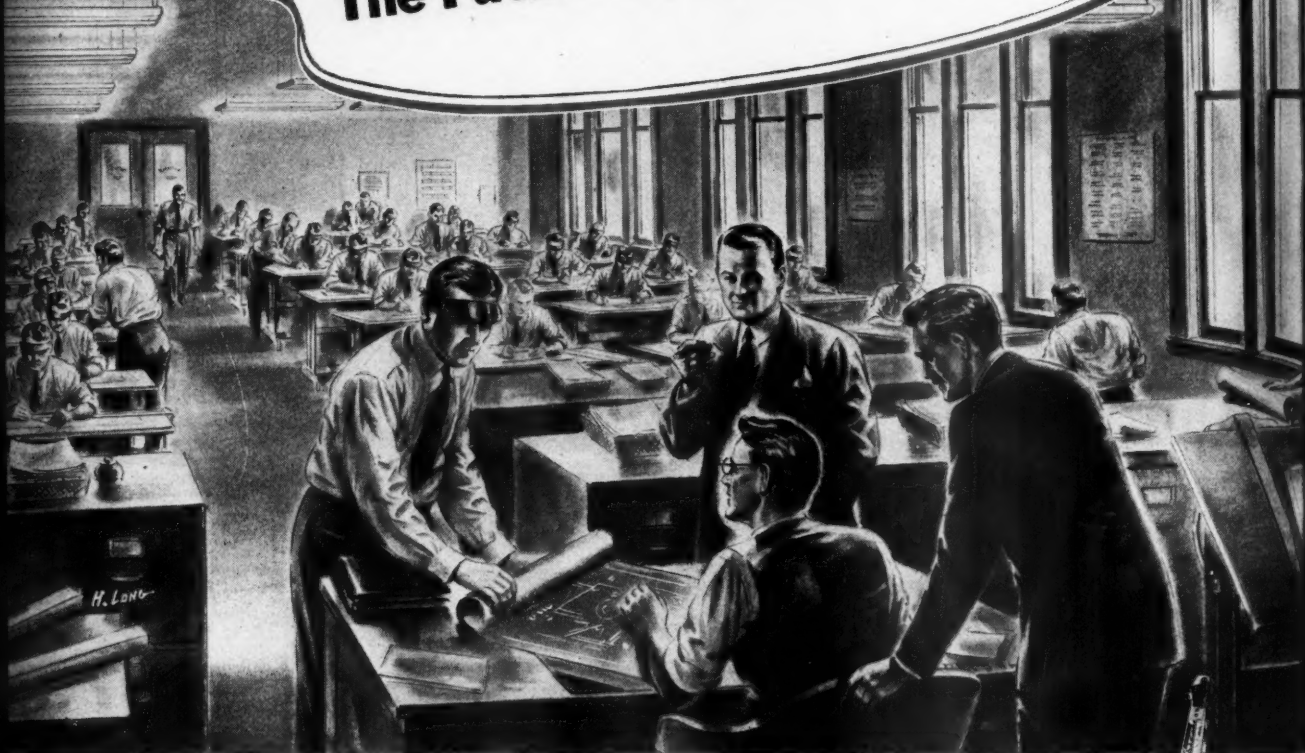


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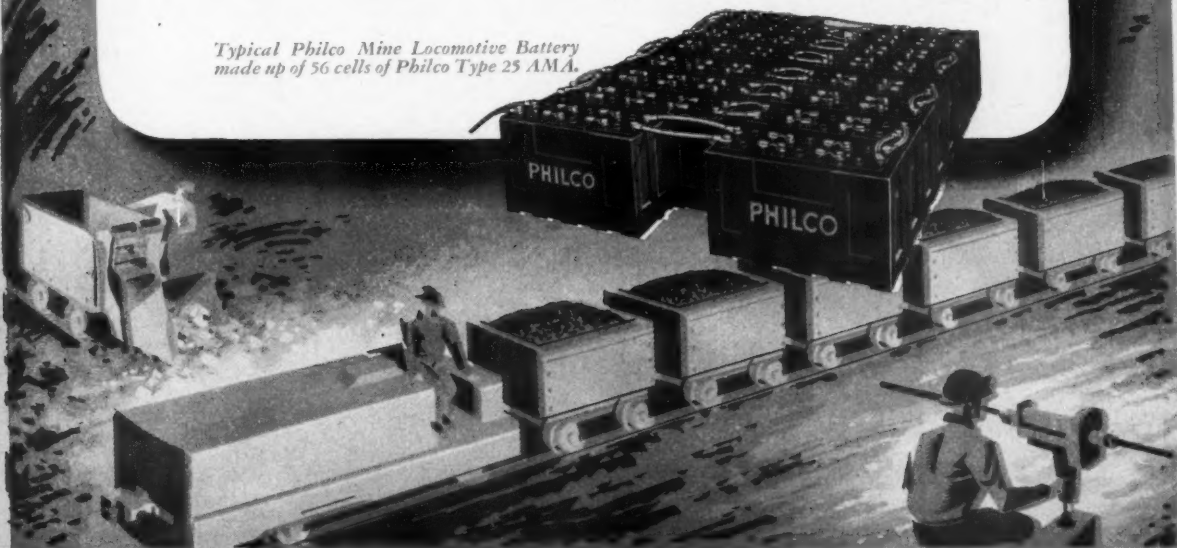
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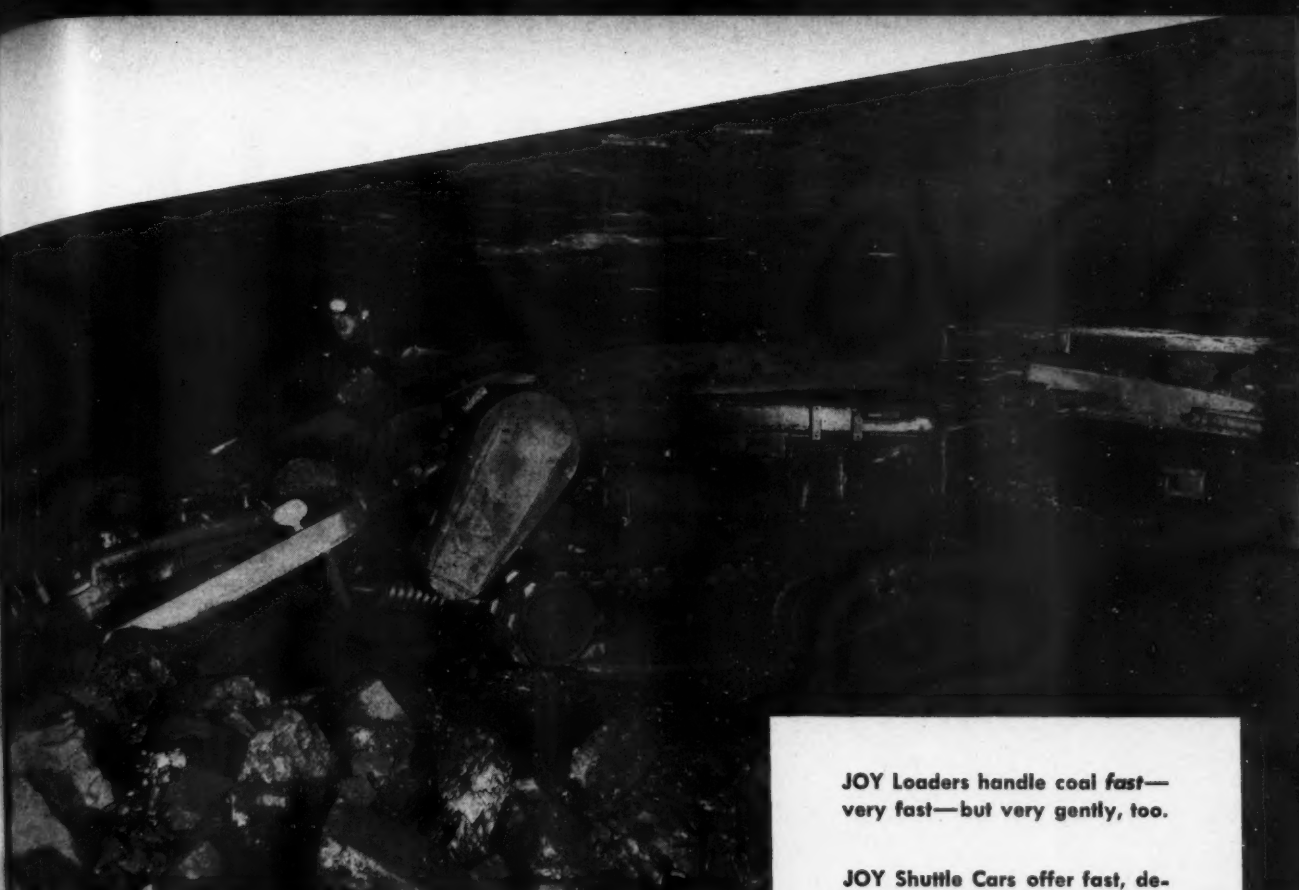


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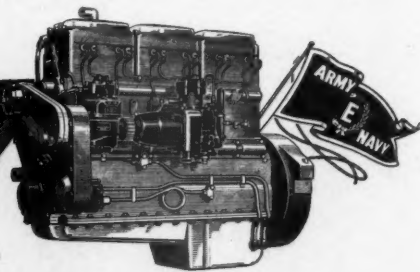
This Fuel Conservation started 15 years ago !

The principle of Fuel Conservation is to eliminate waste without sacrificing any vital need. For example:

In 1928, fire protection for its harbor was a vital need at Portland, Maine, but natural New England thrift rebelled against paying for fuel which would be consumed in idleness . . . in merely keeping up steam to assure having fire protection when it was demanded. After a thorough investigation, the fire boat, City of Portland, was ordered and Cummins Diesel power was chosen for three reasons: *First*, the Cummins Diesel's proved easy starting made certain that the boat would be ready to go any time, day or night. *Second*, the engine's compact size and light weight per horsepower made it an ideal plant for fire pumps and main propulsion. *Third*, the Cummins Diesel's recognized fuel economy and low maintenance assured a low operating cost.

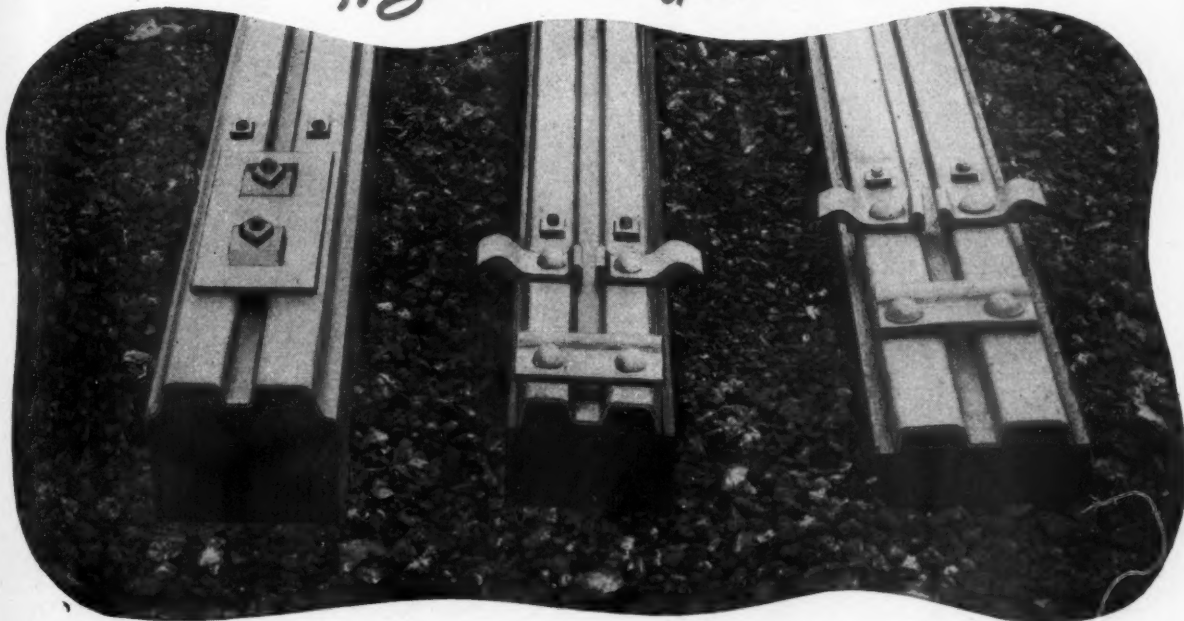
In 15 years of duty on Portland's water front, and in comparable terms of service in fire boats at Chicago and Ketchikan, Alaska, Cummins Diesels have consistently demonstrated their ability to provide maximum protection at a minimum cost in dollars, manpower and fuel.

Such economy—multiplied by the many thousands of Cummins Diesels doing scores of jobs essential to a nation at war—becomes doubly valuable now when every dollar and every man and every drop of fuel is so vitally needed to push the fight on the battle front and the home front. CUMMINS ENGINE COMPANY, Columbus, Indiana.



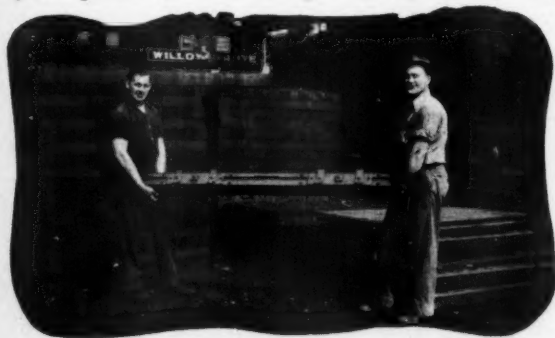
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*..good for many uses—
and many re-uses!*



Operators are constantly finding new uses for Ar-Moored ties. One mine saved thousands of dollars in roof and bottom work by using the 2"-thick tie. Another installed ties of 4" thickness for permanent outside trackage, to permit later rail change. Dozens of others are

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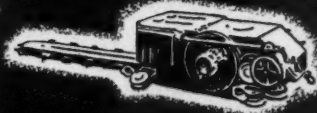
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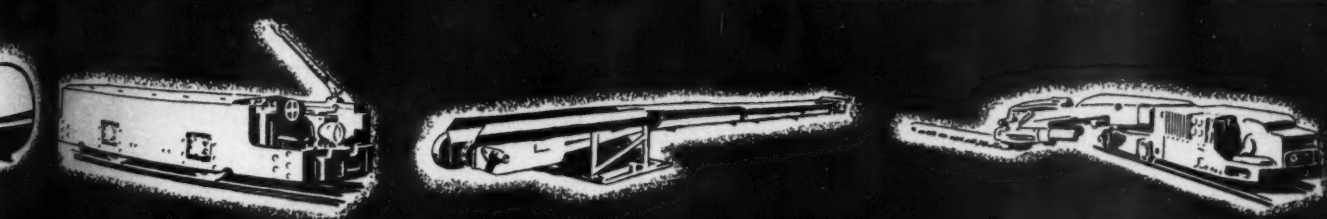
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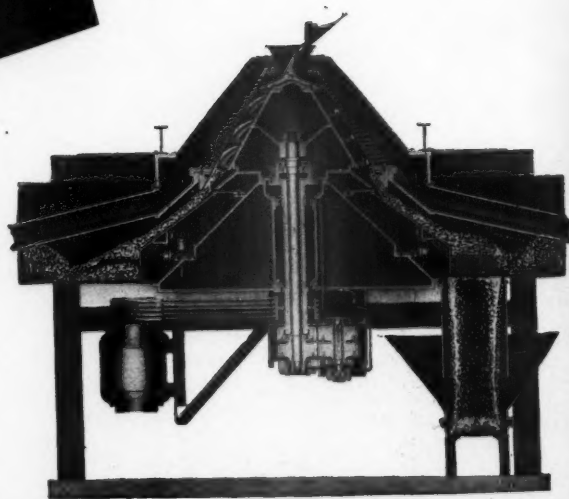
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SECOND AND PRESIDENT STREETS

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A big 10-ton Diesel-powered Mack in grim war paint rushes supplies to the front. Sketched from photos, by Peter Helck.

WAR REPORT... WITH A PEACETIME TWIST!...

For your future reference, we'd like to put two facts on the record now. *Fact One*—there are *more* Mack Diesels in the United Nations' armies than any other make of heavy-duty Diesel truck. *Fact Two*—the only 10-ton Diesel trucks used by United Nations' armies which are made and powered by one manufacturer are Macks. This may surprise you . . . and it may mean a lot some day when you are deciding what Diesel to buy.



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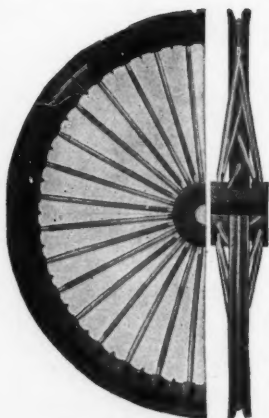
Mines must run—repairs are needed from time to time—therefore, HOLMES has added an emergency repair department as an aid to mines in avoiding serious delays in production. The moment you need repair work, phone 1430 Danville, Illinois and a HOLMES representative will be on the way at once.

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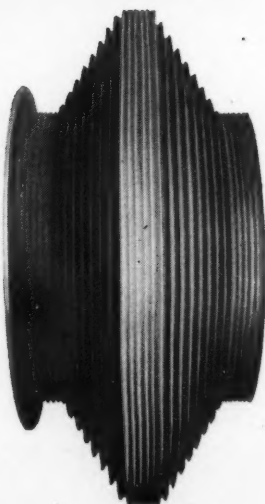
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Write regarding that **REPLACEMENT EQUIPMENT**

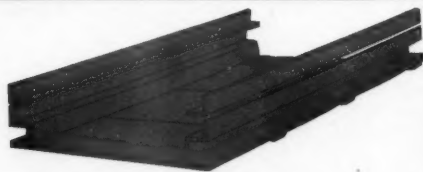
Mines today are looking ahead to their needs—we want to help you in this—try to foresee what you will need in HOLMES equipment and write us now so that we can anticipate our raw material requirements and plan our production accordingly, thus rendering a more complete service in keeping with Uncle Sam's War production program.



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EXPLOSIVE	Approximate No. of 1¼" x 8" cartridges per 100 pounds
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Red H* B	280

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There are six Hercules Slow Permissibles, representing a wide range of cartridge strength and count, that are specially suited for coarse coal production. In cases where high cartridge strength is required the three Red H permissibles are suggested. The three Hercoals are widely used for coal that is more easily broken. In many applications Hercoals are replacing black powder and are giving highly satisfactory results.

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Hercoal* D	450
Hercoal* C-1	400
Red H* F	356
Red H* D	316
Red H* C	276

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Hercogel* A (Gelatin)	200
Hercogel* 2 (Semi-gelatin)	240

*Reg. U. S. Pat. Off.



EXPLOSIVES DEPARTMENT

HERCULES POWDER COMPANY

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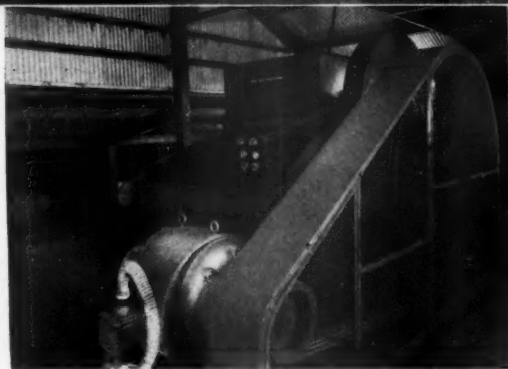
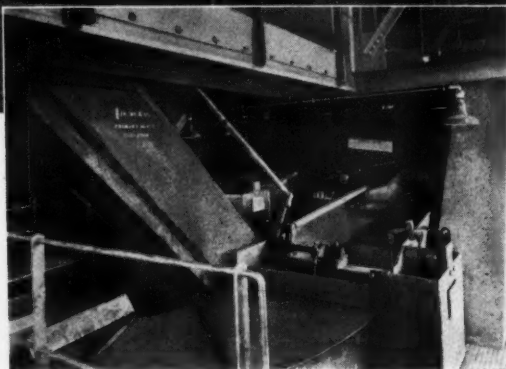
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 TO ITS NEEDS"**

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MINING CONGRESS JOURNAL

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Lift the Statistical Blackout

LATE in October the War Production Board issued a statement reviewing the Board's action in limiting production from marginal producers of minerals. It gives the reasons for the change in its program as "increased mineral output, revised military requirements and a greater need for marginal manpower than for marginal minerals." This move has affected producers of ferro alloys (vanadium, tungsten, molybdenum, cobalt, etc.) as well as producers of lead, zinc, mercury and other minerals.

Operators of such mines are naturally wondering whether there may come a time when their properties may again be called upon to step up production, as the war is not yet over. Guesses on the end of the European conflict range from six weeks to a year or more, but the fact remains the war is not over nor won by the United Nations, and the "Arsenal of Democracy" is still looked to for supplying what it takes to do the job.

Meanwhile the mining industry has a feeling it is on the threshold of a period of uncertainty, and rational guidance and factual analysis of all phases of the industry should be the order of the day.

This can be aided measurably through the release, by the proper government agencies, of metal statistics to help lighten the blackout which has existed since Pearl Harbor. The Bureau of Mines has accurately kept up its work in maintaining mineral statistics of the domestic mining industry, but authorities (not in the Bureau of Mines) prevent even the slightest hint to industry or to the public as to what these reveal.

In the newspapers we are reading releases that tell of ships sunk in convoys at the beginning of the war; the radio announcer may now tell us each morning whether it's going to rain or be very cold, and military officials are permitting large Eastern cities to change their lighting regulations from a blackout to a brownout, thereby allowing more "light on the subject."

The metal and non-metallic mining industry needs more light on a very important subject, that of knowing what has taken place and what it portends for the future; what it must do to prepare itself, as intelligently as possible, for the coming transitional era from a war to a peacetime economy. Except in those cases where disclosure might jeopardize national safety, the industry should be permitted to

know the essential figures on production, stockpiles, and consumption of metals—particularly now that success in the war has emerged far enough to allow a little more attention to economic planning for the future.

Important at this time, therefore, is a lifting of the complete blackout on metal statistics so the industry can better see where it is heading. Blueprints for post-war planning cannot be made without some light for intelligent handling of the tools.

What Coal Wages May Do

IN GENERAL, observers of the recent coal mine wage tangle believe that the Illinois operators and miners can see their future way clear under the wages and hours provided in the agreement which they have supported. It will also be remembered that in the course of the negotiations some months ago, central Pennsylvania operators tentatively advanced a proposal to increase the basic underground day wage scale by \$1.30 per shift. Such proposals have been viewed with apprehension by Appalachian producers who bring forth nearly 70 percent of the coal tonnage of the country, from thin coal beds and under other unfavorable mining conditions.

It has been stated on good authority that while some few mines may have as little as half an hour of travel time, probably 15 to 20 percent of the coal mines in the eastern fields have a travel time of close to 2½ hours per day; and that 15 percent of the nation's coal is produced in mines having travel time of approximately 2½ hours. If a working day of 8½ hours portal-to-portal is used, a mine with 2½ hours travel would work 6 hours instead of 7, and would pay \$1.125 extra, plus the cost of the seventh hour, or an increase of \$2.125 or more per day for the six hours worked.

Fears are expressed in the Appalachian fields that application of the Illinois formula to mines which at present have much higher labor costs will increase the cost of production from 60c to 90c a ton. Comments were made that in such an event the number of coal mines that would have to be liquidated next year would reduce national production from 40 to 60 millions tons, chiefly in the old and widely extended mines.

Owners of coal properties and the miners who operate them are to a material degree in the position of innocent by-standers in the controversy in which the Administration finds itself involved. Unfortunately, mine workers and now also railroad employees have been led to feel that they have been discriminated against in comparison with the wage treatment accorded to workmen in the war production industries, and that accordingly the wage policies of the Administration ought to some extent be overhauled. The unfortunate thing is the pressure which led to the consideration of a portal-to-portal working day as a means of securing an increase in total pay.

Inevitably, serious problems lie ahead for some valuable coal properties together with difficult days for the miners who are now employed in them.

Hydraulic Brakes For Mine Locomotives

PRESENT wartime conditions are requiring the manufacture of tremendous quantities of essential materials; each essential article reverts through its evolution cycle to the basic or raw material and then through the process of fabrication to completion. Steel, copper and other finished products must, during the process, use some form of heat, usually coal, and as a consequence, the mines are working above normal capacity to meet this emergency. The speeding up of production is being accomplished by employing additional equipment where possible, but an analysis of the performance of an operating unit will often show that more tonnage can be produced from existing equipment by raising the efficiency of the present machines.

The various operations of haulage—service for mobile loading machines, gathering, intermediate and main line—require that the locomotives performing these duties should be in good mechanical and electrical condition. The control equipment is certainly a vital factor in securing maximum operation and in the majority of mines the motors, controllers and resistances are carefully scrutinized and maintained. However, the meaning of “control” is incomplete when only acceleration is considered; deceleration is just as important as acceleration and should be recognized as an integral part of the control system, yet the braking equipment is seldom given more than a casual glance.

Although all locomotives are equipped with hand brakes, these require a certain time for operation even when the brake shoes are dragging and the addition of a power brake is desirable to obtain quicker application and more positive stopping. The term “power brake” in mining is usually considered as referring to an air brake; this type gives excellent service on larger locomotives where adequate space is available for the installation, but it cannot be applied on smaller units with restricted space. The “hydraulic brake” was designed to meet these limited space requirements and to produce, as nearly as possible, the same operating characteristics as air brakes. The hydraulic brake equipment is approximately one-fourth the size of similar air brake equipment; it is simple in design, compact yet sufficiently rugged to withstand duty required in mine service, and by proper selection of brake cyl-

Explaining the application of hydraulic brakes to mine locomotives, with special reference to gathering locomotives where space is not available for the installation of air brake equipment.

By C. S. ALLEN

Engineer, Locomotive Division
The Jeffrey Manufacturing Co.

inders can be equally adaptable for gathering units or for main haulage units and tandems.

The complete hydraulic equipment

consists of only four units and piping—motor, pump and tank; accumulator; engineer's valve; and brake cylinder. The installation is a simple matter;

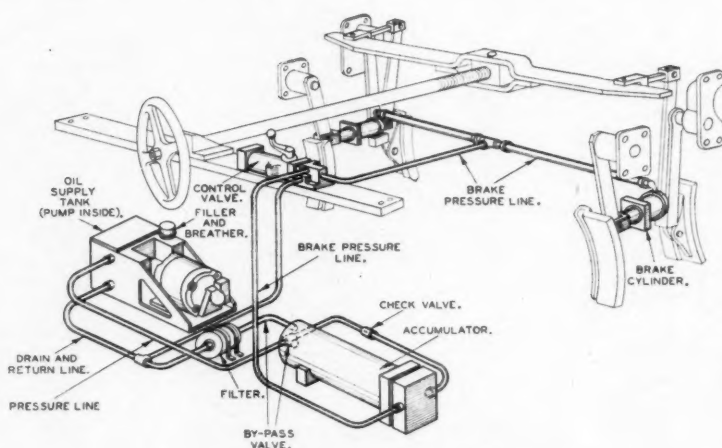


Fig. 1. Hydraulic mounting replacing the hand brake

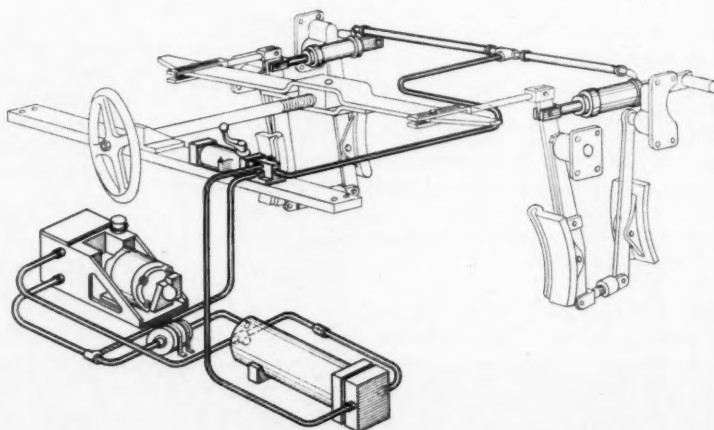


Fig. 2. Hydraulic mounting with hand brake retained as independent unit

Fig. 1 shows an arrangement of brake rigging with the brake cylinders mounted between the shoes replacing the adjusting screw, and Fig. 2 illustrates another type of mounting having a slot cut in the lever so that the cylinder can operate independently of the screw brake, which is always retained for a parking brake.

The motor, tank and pump unit is mounted on a single base. The motor is $\frac{1}{4}$ horsepower continuous rated, having a speed of 1,750 r.p.m., and is direct connected, by means of a flexible coupling, to an axial piston type hydraulic pump. The pump is completely submerged in oil inside the tank; its output is $\frac{1}{2}$ gal. per minute at 1,000 lb. per square inch pressure. Overall dimensions of this unit are 9 $\frac{1}{4}$ in. wide, 11 $\frac{1}{4}$ in. high and 20 $\frac{1}{2}$ in. long.

The accumulator acts as a reservoir for the oil under pressure. It is a steel cylinder with a ground bore, having a cup packed piston backed by two coil springs. When oil is pumped into the accumulator, the piston is forced back against the spring until a predetermined pressure value is reached; then the oil is by-passed, leaving the accumulator fully charged under pressure for instant use. There is sufficient oil in the accumulator to provide several braking applications in the event of power interruption or failure. Each application of brake uses a portion of the oil from the accumulator and after several applications, the available pressure is considerably reduced, but may still be equivalent to a normal brake cylinder pressure of 600 lb. per square inch. When the pressure decreases to this value, the accumulator is automatically recharged. This unit is 7 $\frac{1}{2}$ in. square and 25 $\frac{1}{2}$ in. long.

The engineer's valve which operates the brake is also compact and can be located within convenient reach of the operator. The valve is balanced and can be operated at any pressure from zero to maximum, and due to the balanced construction, the valve handle will remain in any position and maintain a constant pressure as selected until moved by the operator. There is also an emergency position provided which permits the full accumulator pressure to be transmitted to the cylinders; when maximum pressure is desired, the valve handle must be held in the emergency position but when released it will move back to the balanced condition. This valve is 9 $\frac{1}{4}$ in. long, 2 $\frac{1}{2}$ in. wide and 5 $\frac{1}{4}$ in. high.

The size of the brake cylinders is selected for a given locomotive, depending on the weight and brake linkage. Correct brake shoe pressure is very important and should be sufficient to slide the wheels on sanded rails; this, however, does not mean that maximum braking effort is ob-

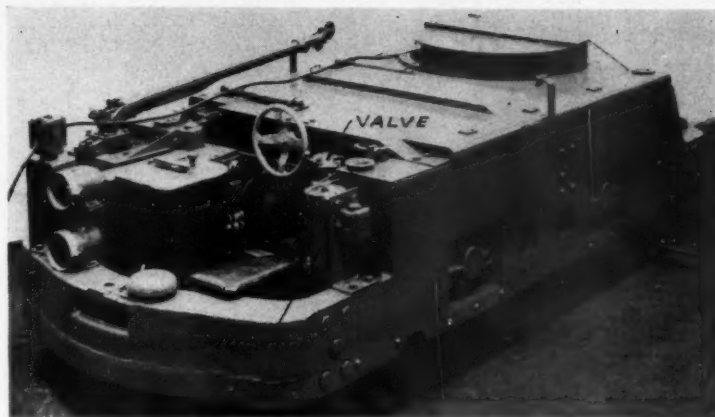


Fig. 3. Hydraulic installation on Gathering Locomotive

tained by sliding the wheels, as actually, the coefficient of friction decreases when the wheels are locked and the locomotive will require a greater distance to stop than if the wheels are rotating.

Gathering Locomotive Service

There is a particular need for power brakes on gathering locomotives which serve mobile loading machines; these are subject to more abuse than the main line units and it also follows that greater ease and flexibility in handling the service locomotive will result in a decreased time in car spotting with a corresponding increase in the productive time of the loading unit.

In usual practice with hand brakes only, the motorman sets the brakes sufficiently to stop the locomotive and "spots" the car by applying power to the motor with the brakes on. The

reversing, or directional controller, is preferred for this duty as it utilizes one operating cylinder for acceleration and reversing, and permits the motorman to use one hand on the controller and the other on the brake. This, however, does not eliminate the undesirable feature of operating the locomotive with the brakes set, nor eliminate the manual effort and the time required for setting hand brakes. Efficiency of gathering locomotives performing service haulage and equipped with the directional controller can be decidedly increased by hydraulic braking, as this permits the operator to move the locomotive with released brakes.

A gathering locomotive so equipped is illustrated in Fig. 3. Note that the engineer's valve is mounted within easy reach of the operator just to the right of the hand wheel, and the accumulator is mounted vertically at the right of the operator. The motor,

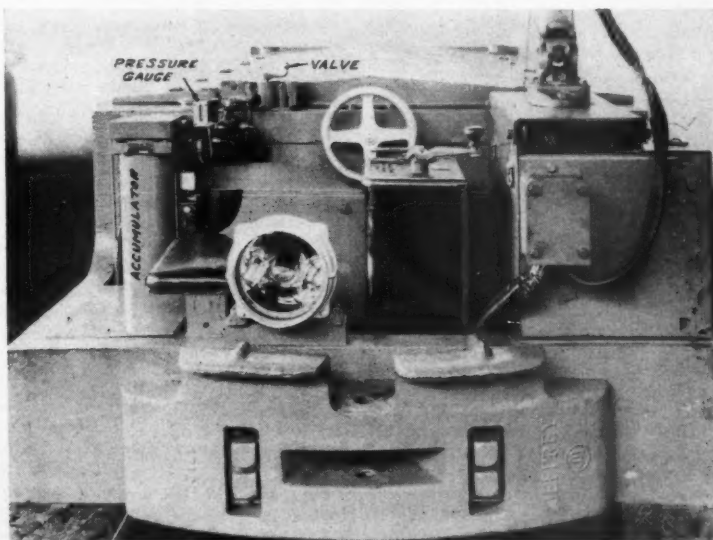


Fig. 4. Hydraulic application to Main Line Locomotive

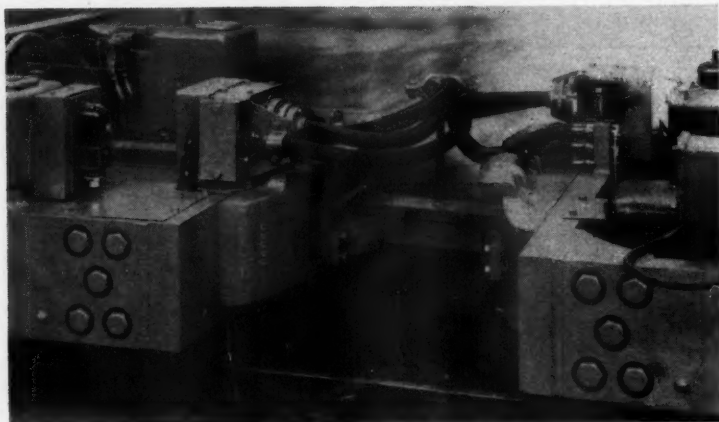


Fig. 5. Cross connections for complete control of tandem unit

pump and tank unit is mounted on the deck plate back of the rear motor, and brake linkage is slotted as shown in Fig. 2.

Main Line Haulage

Main haulage locomotives have a larger deck space; therefore, the installation of the various units is not much of a problem. A locomotive of

this design is shown in Fig. 4, and it will be noted that the accumulator is installed horizontally between the sand boxes back of the rear motor.

As the weight of the locomotive increases, the difficulty of control also increases and power brakes become essential; actual experience has shown this to be particularly true for 20-ton and tandems. The heavier locomotives

require the same hydraulic equipment as the lighter types except for larger brake cylinders and the tandem installations require cross connection between the locomotives, as shown in Fig. 5, to give complete control of both units.

Advantages of Hydraulic Brakes

Hydraulic brakes have definitely proved that locomotive maintenance costs can be reduced. By eliminating the practice of operating with brakes set when spotting cars, their use decreases the mechanical shocks, reduces the peak ampere load to a safe value, saves considerable amounts of power and generally raises the performance efficiency of the gathering unit—thereby increasing the total tonnage handled over a given period of time. On all classes of haulage service, uniform deceleration can be accomplished, as the brake shoe pressure can be varied in infinite increments for any grade or trailing load; this complete locomotive control increases safety of operation and also provides greater maneuverability and the decreased maintenance more than offsets the initial cost of equipment and labor required for installation of hydraulic brakes.

Canada's Pinchi Lake Mercury Mine

THIS property is situated on the north shore of Pinchi Lake, 70 miles north by road from Vanderhoof, B. C., the nearest point on the Canadian National Railway. Although a considerable distance north of the main traffic arteries, it is close to the geographic center of British Columbia.

The mercury showings were staked in May, 1938, by A. Ostrem and partners. In the same year, the Consolidated Mining and Smelting Company optioned the property and development work was started immediately. In June, 1940, the first kiln started to produce mercury. A second kiln was added in January, 1941, and the first of three Wedge roasters was completed that October. The other two Wedge roasters were added in 1942.

The general cinnabar mineralization is related to a regional north-west-trending zone of relatively steep-angle thrust faulting where a complex of late Paleozoic sediments is faulted against an assemblage of Upper Triassic and Jurassic rocks. The Pinchi Lake ore bodies are replacement deposits, seemingly associated with a system of subsidiary faults and fractures in the hanging wall of the main fault-zone. Fracturing and porosity of the host rocks,

which are mainly ferro-dolomitized and silicified limestones with some cherts and greenstones, are the important physical controls of ore mineralization. The principal mineral is cinnabar, there being only very small quantities of other sulphides, such as stibnite, pyrite, and some chalcopyrite.

To date, the mine has been developed on five levels, and further levels will be established from a winze now being sunk from the main haulage level. To the end of 1942, total development work amounted to 3.3 miles of lateral openings and over 8 miles of diamond drilling.

The ore is produced from glory holes and shrinkage stopes. Some blast-hole work is being done. Much of the tonnage treated to date has been from the glory holes, but many stopes have been opened up on the various levels. Electric haulage is provided on the two lower levels.

Careful planning has resulted in the development of an efficient reduction plant. Wood has been used for fuel until recently, when oil firing has been added for auxiliary heating. Condenser soot is collected mechanically and passed through a metal trap to a Denver thickener. The spigot is

returned to the roasters and the overflow passes through a series of settling tanks before running to waste. High-grade from the metal trap is put over hoeing tables, the rejects being returned to the circuit above the trap. The metal flows to a mercury storage bank, whence it is pumped into flasks. The whole reduction plant is carefully ventilated, no dead pockets of air being allowed to exist. Continuous atmospheric tests in various parts of the plant eliminate possibility of vapor poisoning. This control is very important where climatic conditions make the closure of the entire plant essential.

The camp is ideally situated along the wooded shore of the lake, and from a scenic standpoint the location is outstanding.



Silver—A Metal of Growing Importance

PRIOR to Pearl Harbor considerable experimental work was conducted in an effort to find suitable substitutes for copper and other strategic metals. It was discovered that silver could assume these new responsibilities, and today it is proving indispensable to American industry. No longer is silver used only as a standard of values and a base in our monetary system, and in the manufacture of jewelry and tableware. Silver and silver alloys are used extensively in every phase of our war industry. They are employed in ships, airplanes, tanks, guns, torpedoes, bombs and shells. Silver wire is superior to copper wire, and no other metal has proved as efficient as silver in bearings used in tank and aircraft motors. Silver is being used advantageously where tensile strength and high-electric and thermal conductivity are a prime requisite. The superiority of silver for electrical purposes has long been recognized. It is a better conductor of electricity than copper, the relative conductivity being 100 to 92.7. In the electrical industry silver is used for contacts in layers, inserts and buttons, only the contact areas consisting of silver. Electrical contacts are also sometimes made of alloyed and powdered silver mixed with other elements. It is also used in telephone and telegraph systems, railway signaling devices, refrigerators, washing machines, air conditioning units and for soldering purposes. In telephone apparatus, contacts on relays are in the form of buttons of silver welded on contact springs. Thus only a few grains of silver are used in each of the millions of contacts that are required in making telephone connections.

The principal properties of silver, upon which much of its usefulness rests, are (1) its resistance to a wide variety of corrosive agents; (2) its strong bonding power; (3) its electrical and thermal conductivity; (4) its remarkable optical reflectivity; and (5) its ability to form salts and compounds with valuable photosensitive and bactericidal properties.

Because of its resistance to alkalis, organic acids, and certain mineral acids (including many products which attack tin), silver found wide use in the chemical industry as a lining for equipment, such as stills, condensers, autoclaves, tanks, piping, heating coils, and reaction vessels, even when tin was readily available.

Since the beginning of World War II, silver has attained a new and critical place in the industrial field as well as in world affairs. Successful wartime services of silver assure for it an important job in the future.

By A SPECIAL CORRESPONDENT

Besides being used as a lining for aircraft bearings it is also used in bearings for diesel engines, tractors, trucks and buses.

The ability of silver to make strong, leak-proof, and corrosion-resistant joints has led to wide use in marine and navy piping, high pressure boilers, transformers, busbar assemblies, and oil floats.

The photosensitivity of silver salts is the basis upon which the photographic industry has been built. The important role that photography plays in this war has greatly increased the demand for silver in this field.

In the pre-war period about 30 million ounces of silver were consumed annually and of this quantity approximately 30 percent was recovered each year. It is difficult and sometimes impossible to reclaim the silver used in many of the newly developed uses. Such large articles as bus bars for electric current will remain intact, but it is unlikely that silver used for brazing parts for airplanes, ships, and bombs will be recovered.

In some uses, such as photographic film, there are as yet no acceptable substitutes for silver. For many other purposes for which silver is eminently fitted, the effectiveness of the metal rather than the price has been the determining factor. Performance is the primary objective. Electric bus bars containing tons of silver would not be economically feasible if the silver had to be purchased outright. But it is being loaned by the Government and will later be returned to the Treasury and replaced by copper with no loss of silver.

Further experiments with silver are being concluded almost daily, which means the consumption of silver in war industry will increase steadily. Additional opportunities for the application of silver have been found by coating with it electrolytically, by alloying it with other metals, and by sintering or mixing it with other metals in a powdered form.

Since 1934, when Congress passed the Silver Purchase Act, the Treasury has purchased newly mined domestic silver at prices fixed by Presidential proclamation, by the Act of July 6, 1939, and foreign silver at various prices.

The silversmiths, jewelry-ware, fountain pen, mirror, electro-plating, photo-engraver, and watch-case manufacturers, until recently, purchased all their requirements from foreign countries at the open-market price quoted in New York.

The expanded utilization of silver for use in the war effort and the scarcity of available supplies impelled the War Production Board to issue a directive on July 29, 1942, which provided that after October 1, 1942, all foreign silver imports were to be allocated for use solely in war production. On February 25, 1943, this order was amended, to the effect that, except for the filling of orders bearing a preference rating of A-1-a or higher, manufacturers were restricted in the amounts of domestic silver they might receive or process to one-half of their 1941 or 1942 consumption, whichever was the higher. These were the peak years for the silver products industry. The order was further amended by the WPB on May 10, 1943, when the quota period was changed from a monthly to a quarterly basis, and certain changes were made in the method of arriving at the quotas which further restricted the use for nonessential purposes.

The Treasury, which formerly purchased all newly mined domestic silver at 71.11¢ per ounce and, was an important buyer of foreign silver at 35¢ an ounce, has made no new contracts for the purchase of foreign silver since November, 1941, and has bought but little newly mined domestic silver since August, 1942.

This newly mined domestic silver is now in great demand by manufacturers who do not have priority rat-

ings for the purchase of foreign silver. On March 23, 1943, manufacturers, wholesalers, and retailers of specified lines of silver articles, such as jewelry, fountain pens, silverware, mirrors, watch cases, and insignia, which contained newly mined domestic silver, were permitted to increase prices by 36¢ for each troy ounce of such silver contained.

In spite of the increased demand for silver in the United States, the price of domestic silver has not increased since the Act of Congress of July 6, 1939, which established a net price of 71.11¢ an ounce. However, the maximum price of foreign silver was raised on August 30, 1942, from 35¢ to 45¢ an ounce. Before this official action was taken, competition among domestic manufacturers had grown so keen that some concerns were reported paying as high as 65¢ an ounce in Mexico.

The Metals Reserve Co., a subsidiary of the RFC, has been authorized to maintain a stockpile reserve of silver not to exceed 20 million ounces, for release as needed to meet war requirements. Since November, 1942, they have been purchasing foreign silver, including frozen foreign stocks, for this purpose. Metals Reserve Company will continue to take up excess foreign silver, if any, as it comes into the country and stockpile it for allocation by the WPB for consumptive uses in the war effort.

The Treasury Department on May 6, 1942, made available a minimum of 1 billion troy ounces of its "free silver" stocks (i.e., metal not held as reserve against silver certificates) for release, in the form of loans. In addition, "silver ordinary," consisting of silver recovered from melting and coining processes, totaling slightly less than 5 million ounces, was made available by the Treasury, in late 1942, at 45¢ per ounce to industrial users with high priority ratings who were recommended by the WPB. This silver was formerly available for making medals and for similar uses by private organizations.

Still further supplies were made available on July 12, 1943, when an Act of Congress authorized the President, through the Secretary of the Treasury, upon the recommendation of the chairman of the WPB, to sell at 71.11¢ an ounce for war uses and civilian needs Treasury stocks of silver not required for redemption of outstanding silver certificates, and to lease to war plants monetized bullion silver for a period not to exceed five years. This act will expire December 31, 1944.

On July 29, 1943, the WPB revised its regulations covering the distribution of silver and stated the specific uses which might be made of Treasury silver, foreign silver and domes-

TABLE 1
UNITED STATES CONSUMPTION IN INDUSTRY AND THE ARTS, CALENDAR YEARS 1929-42
(In millions of troy ounces)

Year	Total issued by refineries	Scrap and old material returned to refineries	Net new material	Year	Total issued by refineries	Scrap and old material returned to refineries	Net new material
1929....	42	11	31	1936....	36	17	19
1930....	36	9	27	1937....	51	23	28
1931....	33	9	24	1938....	39	19	20
1932....	24	10	14	1939....	70	25	45
1933....	29	18	11	1940....	67	23	44
1934....	40	28	12	1941....	93	20	73
1935....	41	36	5	1942....	*115	†	†

* Handy and Harman estimate.

† Not available.

Source: Annual reports of the Director of the Mint; Handy & Harman annual reviews.

TABLE 2
ESTIMATED GROSS CONSUMPTION OF SILVER, BY SELECTED INDUSTRIES, CALENDAR YEARS 1929, 1931, AND 1939-43
(In millions of troy ounces)

Industry	1929	1931	1939	1940	1941	1942	1943
Bearings .....	..	..	..	..	..	10	25
Photographic goods ¹	8	7	13	12	18	20	20
Brazing alloys .....	..	..	..	..	..	2	20
Contacts .....	..	..	..	..	..	10	10
Dental and surgical supplies....	3	3	3	3	3	2	5
Insignia	4	4	4	4	4	5	5
Solder	1	1	4	4	4	1	4
Chemical products, n. e. s.	2	2	1	2	3	3	3
Sterling silverware	10	9	11	14	50	530	530
Silver-plated ware	4	2	5	4	5	..	..
Jewelry	3	2	3	3	3	10	5
Unclassified	2	1	1	6	1	30	32
Total	30	24	34	41	80	121	159

¹ Figures for 1939-41 represent silver nitrate. By far the largest use of silver nitrate is for photography; other uses are for silvering mirrors and in pharmaceuticals.

² Not shown separately; included in "Unclassified."

³ Estimated at less than 1 million ounces.

⁴ Not available, but known to be small.

⁵ Figures include estimates of silver used in the production of silverplated ware for the Army and the Navy.

Source: Data for 1929 and 1931 are estimates of Charles W. Merrill, U. S. Bureau of Mines, and are based on questionnaires received from the industries concerned. Estimates for later years are based on data of the American Bureau of Metal Statistics, Handy & Harman annual reviews; and for 1942 and 1943 totals, statements of G. H. Niemeyer, representing Handy & Harman, and Richard J. Lund, War Production Board, in hearings before a subcommittee of the Committee on Banking and Currency, U. S. Senate, 78th Congress, 1st Session, April 28 and 29, 1943.

tically mined silver. Treasury silver may be used in the manufacture of engine bearings, brazing alloys, solders, and official military insignia; foreign silver may be used in the manufacture of medicines and health supplies, electrical contacts and other miscellaneous products, and domestically mined silver may be used (upon the basis of 50 percent of 1941 or 1942 consumption) in the manufacture of such articles as silverware and jewelry.

Table 1 shows the gross amount of silver used in United States industries in the calendar years 1929-42, the amount returned to the refineries by manufacturers and dealers in the form of new scrap and old material,

and the net consumption. The amount of material returned had increased markedly between 1930 and 1939 but it lessened somewhat during 1940 and 1941. Substantial quantities of silver that are being used now will not be recovered. Moreover, the quantity of old material turned in by owners may decline somewhat because of the increasing inability of civilians to obtain new table silverware and other silver products to replace the old. If prices should advance materially the return of old material might increase.

Nearly 60 percent of the silver consumed by private industry in the United States in 1942 is estimated to have gone into products classified by

TABLE 3.
UNITED STATES CONSUMPTION OF SILVER IN DOMESTIC COINS, FISCAL YEARS
1929-42
(In millions of troy ounces)

Year	Quantity	Year	Quantity
1929.....	5	1936.....	20
1930.....	7	1937.....	24
1931.....	*	1938.....	14
1932.....	*	1939.....	8
1933.....	*	1940.....	19
1934.....	2	1941.....	36
1935.....	23	1942.....	79

* Less than 1 million ounces.
Source: U. S. Bureau of the Mint.

TABLE 4.
UNITED STATES SILVER PRODUCTION AND GOVERNMENT PURCHASES, CALENDAR
YEARS 1934-42, AND BY MONTHS, JANUARY, 1942-JUNE, 1943,
AND NET IMPORTS, 1934-40
(In millions of troy ounces)

Year and Month	United States pro- duction	Net imports of silver (except coins) ¹	Government purchases			United States production + net imports — Government purchases ²
			Newly mined domestic	Foreign	Total	
1934	32	154	22	172	305	—119
1935	46	515	38	494	354	+29
1936	63	234	61	272	333	+36
1937	71	154	71	241	312	—87
1938	62	243	62	355	417	—112
1939	64	172	61	283	343	—107
1940	67	157	68	140	208	+16
1941	69	4	70	73	143	
1942	54	4	48	14	62	
1942:						
January ..	4.8	4	6.0	3.3	9.3	
February ..	4.5	4	4.7	3.4	8.1	
March	5.3	4	5.1	2.8	7.9	
April	5.6	4	6.4	3.2	9.6	
May	4.9	4	7.0	1.7	8.7	
June	4.5	4	4.0	.....	4.0	
July	5.0	4	5.5	.....	5.5	
August	4.4	4	2.9	.....	2.9	
September .	4.6	4	2.5	.....	2.5	
October ...	3.8	4	2.0	.....	2.0	
November .	3.3	4	1.2	.....	1.2	
December .	3.7	4	.5	.....	.5	
1943:						
January ..	3.7	4	.1	.....	.1	
February ..	3.5	4	.1	.....	.1	
March	3.8	4	.6	.....	.6	
April	3.6	4	1.6	.....	1.6	
May	3.8	4	1.3	.....	1.3	
June	3.4	4	1.2	.....	1.2	

¹ Imports of base and refined bullion minus similar exports.

² A negative quantity indicates that Government purchases during the year were greater than current annual supply; a positive quantity, that they were less; excess purchases must have been made from stocks within the country.

³ Includes 111 million ounces in 1934 and 2 million ounces in 1935 of nationalized silver acquired at 50 cents per ounce by Executive proclamation of August 9, 1934.

⁴ Import data beginning with the last quarter of 1941 are confidential and not for publication. Source: Bulletins of the U. S. Bureau of the Mint, official statistics of the U. S. Department of Commerce, and press releases of the U. S. Bureau of Mines.

the WPB as essential to the war effort and thus covered by priority ratings. Consumption by the silverware industry, formerly the largest users of industrial silver, reached a high level in 1941 but declined in 1942 because of the scarcity of silver and the increased restrictions governing the use of foreign silver. Total consumption in 1943 is expected to reach abnormally high levels while production will show a marked decrease. The largest increase in use, as indicated by trade reports and estimates of the WPB,

are in bearings, photographic goods, brazing alloys, solder, electrical contacts, and dental and surgical supplies.

Wages in Cash Increases Silver Coinage Circulation

Demand for silver for coinage purposes has increased greatly due to wages being paid largely in cash rather than by check and the increased payment for purchases with cash instead of through charge ac-

counts. Of 2,114,890,662 coins of all kinds produced during the fiscal year ended June 30, 1942, approximately one-fifth, or 449,336,162 were silver coins. Seventy-nine million ounces of silver were required for domestic coinage purposes in 1942 and 12 million ounces of silver were minted in the United States mints for foreign countries. Roughly, half of these foreign silver coins were for the Netherlands Government and Australia. The silver required in the production of coins for a foreign government ordinarily is deposited by the government with the United States Mint.

In December, 1942, the Secretary of the Treasury announced that silver for coinage (whether minted here or elsewhere) would be supplied to Great Britain, Australia and certain other countries on a lend-lease basis. On July 2, 1943 it was announced by the Office of Lend-Lease Administration that shipments of silver totaling 3,075,000 ounces had been supplied Great Britain by the United States. This is to be returned to the United States on an ounce-for-ounce basis after the war. Further shipments of lend-lease silver to Great Britain and other countries will follow.

Dollars, half dollars, quarters and dimes are made of silver 0.900 fine. The fine silver content of the dollar is 0.7734 ounce. No dollar coins are now being minted. In March, 1942, the Treasury stopped making the old 5-cent piece which contained 25 percent nickel and 75 percent copper. The new 5-cent pieces now being coined contain 35 percent silver, 56 percent copper and 9 percent manganese. This will save all of the nickel heretofore used in the coins (450 tons in 1941), and 19 percent of the copper formerly required for their mintage. In the fiscal year 1942 the new 5-cent piece consumed more than 5 million ounces.

Table 3 shows U. S. consumption of silver in domestic coins in the year 1929-42.

There has been a decided decline in silver production in the United States in 1942 and 1943 due partly to shortage of manpower and partly to the closing of gold mines which produced some silver.

Thus far in 1943 there has also been a decline in imports due in part to lack of transportation, labor difficulties, and increased coinage demand in those foreign countries which export silver to the United States.

Total requirements, however, are expected to be even larger than in 1942. In the calendar year 1942, 54 million ounces of silver were produced in the United States. 47.8 million ounces of this domestic silver and 14 million ounces of foreign silver was purchased by the United States Treasury. Actual gross industrial

(Continued on page 61)

Prevention of Accidents From Roof Falls in Metal Mines —Part I

Mine supervisors should insist upon the miner following a standard and rigid routine of inspection at the beginning of every shift.

THE HAZARD of falling rocks, roof and coal is the greatest single cause of personal injuries in mines. The Health and Safety Committee edited and submitted to the A. I. M. & M. E. a sort of consolidated report upon this subject from each of the several coal and metal mining districts of the country for their annual meeting of 1941. Our concluding paragraph made the following comments: "It must be remembered that, in the coal and metal mines of this country for the past 50 years, an average of 1,000 lives per year have been taken by this cause. If the killing of 231 miners per year by the more spectacular explosions of gas and coal dust warrants the tremendous amount of attention which it is receiving, and we all agree that it does, then certainly the prevention of 1,000 deaths from this equally controllable hazard of falling ground, rocks and coal, challenges the ingenuity of the supervisory force of all our mines."

Although the title of the paper assigned to me includes all metal mines, I will have to confine myself almost solely to the metal mines of the Butte, Mont., district. However, the statistical information given will have a familiar sound to all metal mine operators, and the suggestions made will, in general, apply to many, if not most, metal mine operations.

Practically all of the actual mining in the Butte District is done on contract, payment being made on a basis of cubic feet excavated. The cross-cuts are generally driven 8 x 6 ft. in cross section, and the drifts 9 x 7 ft., the raises and stopes are driven the width of the vein, and the stopes are about 25 ft. long between chutes. Various stoping methods, including the square set, rill, stull, and horizontal cut and fill, are used. One may get some idea of the proportional use of the various stoping methods by comparing the shifts worked in each, which are shown in a later tabulation.

The supervisory organization consists of a general superintendent in charge of all operations, several assistant general superintendents, each in charge of a group of mines, and each mine in charge of a foreman. Each of the larger mines has from one to six assistant foremen, and each of these has from four to six shift bosses. The average shift bosses' crew is 23 men, including miners, motor crews, pipemen, trackmen, etc. Each mine also has a safety engineer who reports directly to the mine foreman and to the Bureau of Safety. There is one chief safety engineer who reports directly to the Bureau of Safety and who spends most of his time in making mine and plant inspec-



By JOHN L. BOARDMAN

Chairman, Bureau of Safety
Anaconda Copper Mining Company

tions in company with the regular safety engineers.

The mine safety engineers' reports are posted daily upon a board in the shift bosses' office so that they may make prompt corrections of dangerous conditions noted. A regular safety meeting of foremen, assistant foremen, and bosses is held at each mine, and a semi-monthly meeting of foremen and superintendents is held at the Bureau of Safety Assembly Room. A constant educational campaign of safety posters, picture slides and shift bosses information sheets is kept up.

To submit a tabulation of falling ground accident frequency, based upon the total amount of time spent by men

Year	Hours worked	Falling ground and rocks				All other causes				Percent of total due to falling ground				Total falling ground per million hours worked	Total others per million hours
		F.	Ser.	Slt.	Tot.	F.	Ser.	Slt.	Tot.	F.	Ser.	Slt.	Tot.		
1935 ...	9,270,170	2	166	106	274	4	393	332	729	33.33	29.69	24.20	27.32	29.55	78.64
1936 ...	13,502,344	5	248	198	451	7	607	564	1,178	41.66	29.00	24.67	27.68	33.41	87.28
1937 ...	18,340,612	8	301	271	580	14	589	907	1,510	36.36	33.81	23.84	27.75	31.62	82.33
1938 ...	9,715,162	4	128	105	237	5	293	346	644	44.44	30.44	23.28	26.90	24.40	66.29
1939 ...	11,589,680	10	221	122	353	4	355	316	675	62.50	41.15	27.85	34.43	30.46	62.47
1940 ...	14,984,918	11	257	92	360	8	472	244	724	57.89	35.25	27.38	33.21	24.02	48.31
1941 ...	17,014,698	13	239	59	311	13	530	210	753	50.00	31.08	21.93	29.23	18.28	44.25
1942 ...	19,342,320	8	242	84	334	10	540	223	773	44.44	30.94	27.36	30.17	17.27	39.96
Total.	113,759,904	61	1,802	1,037	2,900	65	3,779	3,142	6,986	48.41	32.29	24.81	29.45	25.50	61.41

in and about the mines, would not give us a true picture of the actual hazard, but it will provide a means for making comparisons and will, after all, tend to flatten out the curve when we plot the tabulation graphically. Every man who goes underground is, of course, subjected, in a greater or lesser extent, to the hazard of falling ground and rocks. The men who work at the face take the largest amount of the risk, and the men who work in the drifts and crosscuts back from the face, the lesser. But even these men, as well as the actual miners are exposed to the possibility of rocks falling down manways and shafts, from ore chutes and from the back and sides of drifts and crosscuts as they pass to and fro through these passageways. Therefore, the following tabulation is based upon the total hours worked in all Butte mines of the Anaconda Copper Mining Company for the periods shown.

This tabulation shows the relative importance of falling rocks as an accidental injury cause. This cause accounted for 48.41 percent of all fatal injuries, 32.29 percent of serious injuries, 24.81 percent of the slight injuries, and 29.45 percent of the total lost-time injuries. Added significance is given these percentages when it is realized that the major portion of these injuries occurred to the men who are engaged in breaking ground, and these as a group constitute about 40 percent of all underground workers.

Causes of Loose Rock

During the period of eight years covered by the above tabulation, there was but one accident due to what might be called caving ground. This accident took a toll of two lives. All of the other injuries were caused by falling rocks, none of which was of more than 2 or 3 tons in weight, and nearly all of them were rocks ranging in weight up to 100 or 200 pounds.

Blasting—The influence of blasting as a cause of loose rocks is, in Butte, more pronounced than it is in many other mining districts. The ore bodies are not hard rock as compared with the ore in other districts, and the country rock, both in foot and hanging walls, is comparatively soft. The veins contain numerous talcy seams, fault slips, and soft gangue material, while the walls, particularly hanging walls, are frequently characterized by fault slips, ancient water courses and cracks, as well as soft, highly-altered sections. Thus, when the walls are frequently much softer and much less uniform in structure than the ore and vein material, heavy blasting is a considerable factor in causing loose rocks.

Faults—Faults which cause displacement of the vein frequently pre-



sent brecciated material that contributes to the looseness of the ground and fault slips which have varying thicknesses of talcy material are likely to be encountered running in almost any direction through the vein structure and out into the walls. These cause the material in the veins to become loose, and frequently contribute to loosening pieces and slabs in the hanging walls. It is, however, when a crack produced by blasting intersects one of these faults or slips that the most dangerous conditions are produced.

Pressure—Another cause of loose rocks is vertical or lateral pressure. Of course, the pressure is all vertical, due to the weight of overlying rock, but it frequently is expressed laterally by moving soft or weak walls in a direction toward the drift or stope in which it appears. There is, in some cases, spawling due to weight, but this is not particularly common.

Weathering—Miners of the Butte District complain of "air slack" as a

cause of loosening rocks. This is probably true, as the sides of drifts and crosscuts frequently crumble and slough upon exposure to the air and from temperature and humidity changes which take place more or less intermittently. However, the writer does not believe this is a prominent factor in loosening rocks at the freshly-broken working faces where some men like to use this as an excuse when the safety inspector finds an incomplete job of barring down has been done. There is no doubt that, although the Butte mines are not classified as wet mines, the presence of water percolating through the veins in raises and drifts does cause overhead rocks to become loose during the shift's work and perhaps after the barring down job has been done.

In the Butte District, except for an occasional section of a drift which does not later have to be stoped out, there is but one operation which will stand open without support, either by means of timber or filling. This one

is the crosscut in country rock, and even these encounter occasional soft sections which must be timbered. One of the best methods so far developed for holding open an untimbered crosscut or a drift, when a section of drift will stand without timber, is to arch the back to at least a 45-degree angle. This is done by blasting an extra hole in the center of the back. The principle of arching can be used to a very limited extent in working flat-back stopes in which the hanging wall is likely to slab off before the filling can be brought in.

Area of Excavations—The area of the openings made in all of the mining operations is an important factor in the cause of loose ground, as is also the length of the rounds blasted. In raises in which faulted ground is encountered, it is not practical to reduce the width of the raise, but the operation can be more safely handled by reducing the length to one set in advance and stoping out the other two sets after the advanced set has been timbered. Sometimes, instead of reducing the cross-section of raises, the length of the round is shortened from the standard of 7 ft. 9 in., which is the net length of a standard post, to a length of 5 ft. 4 in., which is the length of a standard cap. The cap is then stood for posts, and is locally called a "cap set."

Time Element—In cases in which rock is loosened by the weight or pressure of overlying strata, the time element is very important. This is most apparent in stoping operations. The pressure, being more or less constant and uniform, requires time to fracture the walls—particularly the hanging wall—and the ore in the back of the stope. It has been found that, in the flat back or horizontal cut and fill stope when the cycle of operations proceeds without interruption, very little difficulty is encountered. But any delay which causes the stope to remain idle a few days is likely to cause considerable trouble with loose hanging wall slabs and caving of the ore. In this operation, a cut is blasted down onto a previously-laid floor. Then, by means of scrapers, the broken ore is dragged into the chutes. The floor is then taken up, and the excavation filled with waste rock dragged in and distributed evenly by means of the scraper. This filling is brought up to about 3 ft. below the back, and the floor re-laid in readiness for another cut. The complete cycle of blast, clean out, fill and floor in a stope of medium width requires six days.

The influence of time is also important in all other stoping methods, but is somewhat modified in the timbered stopes by the support given by the timber. In this connection, it might be interesting to note the comparison of falling ground injury rates

TABLE 2.

SQUARE SETS

Year	Shifts	Fatal	Ser.	Slt.	Total	Rate per 10M shifts
1939—6 mo.	93,214.50	2	41	14	57	6.13
1940	166,417.75	1	51	18	70	4.21
1941	153,942.25	1	32	7	40	2.60
1942	129,919.00	3	32	11	46	3.54
Total	543,493.50	7	156	50	213	3.919

STULL STOPE

1939—6 mo.	31,617.00	2	12	5	19	6.01
1940	21,587.25	0	3	1	4	1.85
1941	42,879.50	1	6	6	13	3.03
1942	29,811.25	0	7	0	7	2.35
Total	125,895.00	3	28	12	43	3.416

HORIZONTAL CUT AND FILL STOPE

1939—6 mo.	38,220.25	1	16	17	34	8.90
1940	49,736.75	4	22	8	34	6.84
1941	86,607.25	3	43	4	50	5.77
1942	107,133.50	2	39	8	49	4.57
Total	281,697.75	10	120	37	167	5.928

TIMBERED RILLS

1939—6 mo.	19,329.75	0	12	8	20	10.35
1940	24,175.50	0	22	6	28	11.58
1941	19,937.50	0	9	2	11	5.52
1942	33,718.25	0	5	5	10	2.97
Total	97,161.00	0	48	21	69	7.102

OPEN RILLS

1939—6 mo.	54,293.25	3	29	19	51	9.39
1940	73,063.25	1	23	12	36	4.92
1941	46,036.50	0	17	6	23	5.00
1942	53,141.25	0	27	5	32	6.02
Total	226,534.25	4	96	42	142	6.268

SILLS (Not Mining)

1939—6 mo.	298,466.00	0	10	6	16	0.54
1940	408,300.75	0	9	2	11	0.27
1941	457,016.00	0	8	2	10	0.22
1942	542,496.25	0	12	0	12	0.22
Total	1,706,279.00	0	39	10	49	0.287

SILLS (Mining Only)

1939—6 mo.	131,832.00	2	50	28	80	6.07
1940	173,529.50	2	50	15	67	3.86
1941	208,696.00	2	42	8	52	2.49
1942	230,533.00	2	48	14	64	2.78
Total	744,590.50	8	190	65	263	3.532

RAISES

1939—6 mo.	76,994.75	0	45	19	64	8.31
1940	111,307.50	3	66	24	93	8.36
1941	132,996.75	3	61	12	76	5.71
1942	154,445.00	0	51	17	68	4.40
Total	475,744.00	6	223	72	301	6.307

in the different mining operations. Table 2 shows the frequency of lost-time injuries due to falling ground and rocks per 10,000 shifts of actual time worked in the various operations.

Supervisory Responsibility for Prevention—In the prevention of falling rocks injuries, the job of barring down is of the utmost importance. Supervisors should insist upon a standard

routine which should be: Upon arriving at the working place at the beginning of the shift, the miner should rearrange his vent tube if one is provided, then wet down the back, sides, floor and muck pile, remaining under timber or under safe back while doing this. He must then inspect the timber and replace or re-tighten any timber which has been disturbed by the blast. He should then spend some time looking over the back and sides of the place before he goes under any loose rock. For this, he must have adequate light. After thus "sizing up the situation," he must then clear away underfoot, fix floors, and remove any pieces of timber or other material which might constitute a stumbling or falling hazard. It is at this point that the pinch bar becomes important.

The bar should be as light as possible, consistent with the work to be done. It should be long enough to enable him to reach the back without having to stand under the ground which he intends to work on, and so that he does not have to hold the bar directly in front of his body. The bar should have a guard made of a piece of rubber hose to deflect any rocks which might slide down the bar. It should be sharp with a fulcrum chisel bit on one end and a straight pick point on the other end. Thus equipped, he then selects a spot which can be trimmed down from his position under timber or under a known safe place. After trimming down this spot, he may then advance into it and bar down radially from there. In case no such safe spot can be found, he must make one by stalling ahead of himself. Temporary safety stulls may be set upon a footboard on the muck pile, from the timber or from the walls. In case he cannot safely go under the loose rock to set the stull, he can advance the footboard out onto the muck pile, then measure for the required stull and headboard, then secure the correct length of stull and nail the headboard onto it, then place it and tighten by driving wedges between the bottom of the stull and the footboard.

In the barring down operation, it is important that the miner be taught that he must not depend solely upon his sense of hearing to determine whether or not a rock is loose. He should also observe closely and intelligently the direction taken by any slips and cracks, especially where there might be a crack caused by blasting which runs toward a slip or other natural check in the ground. The intersection of such cracks and slips frequently delineates slabs which are so loose that they do not give the characteristic drummy sound of loose rock. In such cases, it is only by visual inspection, assisted by adequate lighting, that this kind of pieces can be discovered and taken down.

In considering injuries from falls of rock in metal mines, we must give some attention to the matter of blasting. Unlike coal seams, which are usually free along the bottom and top strata contacts, many mineral-bearing veins are "frozen" on their contacts or even, in many cases, there is no discernible demarkation between ore and waste rock. This causes the shattering effect of the explosive used to crack the walls of the veins, and produce loose waste rock which the miner would rather leave in place than to remove because it contains nothing of value and costs money to dispose of. The influence of blasting depends also upon the type of round or the arrangement of the drill holes with relation to each other and to the back and sides of the excavation.

"Burn-Cut Round" Has One to Several Straight Holes

As an example, the so-called "burn-cut round" is, in some types of ground, a very frequent cause of loose rock in back or sides. The burn-cut round is distinguished from the usual round in that, instead of two or more steeply-slanted cut holes at or near the middle of the breast, there is from one to several deep holes drilled straight into the breast, charged with an excessive amount of powder. These deep holes blast out a small core for the other holes to break to, but this method may produce extensive cracks which sometimes extend for some distance into the rock which is to be left in the drift and frequently produce large loose pieces difficult to bar down, yet dangerous to leave. This is especially true when the vein and walls contain natural checks or slips. The blasting job, including proper direction and location of the drill holes, adequate yet not excessive charge of explosives, and proper sequence or timing of the shots, is one of the skills which the miner must develop by practice as well as by the instruction of the supervisor.

Next in importance to barring down is mine timbering as a means of preventing falling ground and rocks injuries. Many mines use some standard timber set such as square set for raises and stopes, and drift or tunnel sets with or without a sill under the bottom of the posts. In addition to the standard timber set, we have such very important mine timbers as stulls with foot and headboards, safety stringers and booms, as well as back and side lagging, and butt, back and breast blocks. Whatever the kind or method of use in mine timber, the most important element is time. Supervisors should fully realize that it costs as much or more to set the required timber after an accident has occurred as it does to have it set before the rock falls.

In practically every instance in which crosscuts or raises are driven toward a vein, there is a pronounced change in the character of the ground at the point of intersection. In the Butte District, there are numerous faults and vein intersections which produce a like change. After many years of operation and plotting of geological structures, the geologists have been able to map the veins and faults so accurately as to generally predict, within a very short distance, when the drift, crosscut, raise or stope will encounter certain changes in ground characteristics. This geological information enables the supervisor to be prepared to meet the changed conditions. In raises, he is able, by knowing just how far he is from a fault which will present a soft and slabby hanging wall to reduce the cross-section, and thus avoid a cave. Or if his crosscut is about to reach the vein for which he is driving and the geologist's notes show that much brecciated and wet material will likely be present, he may be prepared by getting in an adequate supply of the various timbers required.

"Make It Safe and Don't Get Hurt" Is Not a Safety Instruction

Under the sub-heading of "Supervision" there is just one more item which requires attention here. This is the distinction between admonition and instruction. We so frequently hear a boss, upon leaving a working place, remark to his men: "Now, watch that back and keep it barred down," or, "Make it safe, and don't get hurt."

Such remarks are decidedly not safety instructions, although bosses are sometimes inclined after an accident has happened to claim that they personally warned the injured men about the rocks which fell. However, when a boss actually inspects the working place, sees the loose pieces and points them out particularly to the men, and orders them to take down this one, stull that one, or blast down another, or when he sounds the butt blocks after a blast with his pick and calls the men back and tells them to immediately leave whatever they are doing at the breast and re-tighten the blocks, and in future, to inspect and re-tighten loosened blocks before going up to the breast, then he is not only admonishing but also instructing. Bosses can accomplish little in regard to preventing falling ground injuries unless they follow the general outline of what constitutes a good order. This outline is:

What to do. How to do it. When to do it. Where to do it, and who in particular is to do it.

Part II of Mr. Boardman's article will conclude in the December issue.

A Picture of Absenteeism

Describing a Method Used by a Large Coal Company to Prevent Absence from Work Without a Valid Reason

By G. B. SOUTHWARD

Mechanization Engineer
American Mining Congress

IT goes without saying that the majority of coal miners are staying on their jobs and turning out a fair day's work; otherwise, the coal industry of our country would not be producing 2¼-million tons of bituminous and anthracite each day. However, because of stoppages which occurred during the wage scale negotiations, even this present high rate of production will not meet the 1943 quota. The one source for recovering the lost tonnage is from those part-time workers who disregard or do not realize their obligation to the war effort, and the major problem of correcting absenteeism is therefore directed toward this minority group.

Various methods are being used by coal companies to encourage such men to give full working time, such as miners' committees, personal letters, meetings held by companies and by local unions, etc. Other companies have more novel procedures—enclosing in an employee's pay envelope a number of German marks for lost working time; or sending to an absentee a note purportedly signed by Hitler, thanking him for his cooperation with the Axis. These plans are familiar to all of us, but a somewhat different approach has recently been put into effect by a large coal company which is worth describing in detail, as it seems to have merit. It is based on the psychology that a man does not like to have his faults held up to public view.

Daily Chart Posted

This method is a continuous graphical record, clearly understandable, showing the names of each day's absentees, that is kept posted on a bulletin board for all men to see. It consists of a chart on which the names and check numbers of employees at the mine are listed in the first column at the left-hand side of the page, with columns across the page for each day of the half-month period. Every morning the mine foreman or the superintendent marks on the chart, those who have not reported for work that day; using color crayons and symbols to designate one of four reasons for absence—(1) voluntary (unexcused), (2) sickness, (3) injury and

(4) excused. A new sheet is set up on the first and sixteenth of each month and stays on the board for the succeeding half-month. A reproduction of the chart with the symbols is shown on the opposite page; this is not a direct copy of the record at any of these mines, but is presented to illustrate the general appearance of a chart after 10 days have been posted.

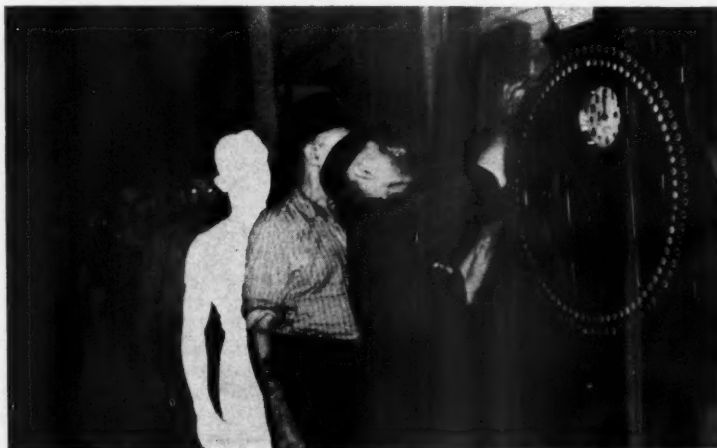
Summary of Results Observed

At all the mines of this company it has been noted that the men are much interested in the charts and that the majority of the employees look at the bulletin boards before going into the mine or after coming out each day. The greater percent do not want to be marked as voluntarily absent; when their names are posted as such, if they do not think it justified, they will raise the question with the mine management and the real cause for absence is generally disclosed. The men will put up good arguments as to why they were away from work and the other employees often get interested and may even take part in the discussion. It also happens when looking over the records, that men will voluntarily tell

why other men have not reported that day—sometimes to absentee's discredit.

The charts have also been used in grievance cases with the mine committee, when men, who make a practice of laying off for reasons other than proven sickness, have been discharged for voluntary absenteeism. When shown the chart with the record of the person bringing the case, the committee has always taken the chart as authoritative. It is generally believed that this record is as accurate as any that can be made, because any individual who has an unjustified voluntary absence marked against him can take the matter up with the mine manager and have a correction made immediately while the matter is fresh in every one's mind. If no protest is made at the time it can be assumed that the record is correct.


One indirect advantage is that the charts furnish to the management a graphic picture of each employee's record; those who work steadily, those who are injured repeatedly, those who are frequently off due to illness, and those who ask to be excused at short intervals. This information can be read at a glance and is much easier to analyze than a payroll sheet.





—U. S. Bureau of Labor Standards


Absenteeism—The little man who wasn't there

BLANK COAL COMPANY
DAILY ABSENTEE RECORD

 Voluntary
Absence

 Sickness

 Injury

 Excused
Absence

Employees	Sun	Mon	Tue	Wed	Thu	Fri	Pay Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
Name and Number																
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Conclusion

The plan has been inaugurated only recently and while sufficient time has not yet elapsed to give accurate figures as to what benefits have actually been derived in the way of reducing

absenteeism, it is believed that the results have been favorable and have aided in getting out more coal for the war program. As expressed by one of the officials: "This absentee chart is the best thing we have tried

out yet. The colors serve to attract the men and they do a lot of talking among themselves about these posted records. I am sure that the charts have accomplished quite a lot of good."



Some of the surface plants of the Bunker Hill and Sullivan Mining Co., Kellogg, Idaho. In the background is the mill which treats about 1,500 tons of lead, zinc and silver ore per day. An extension to this plant is now nearing completion



The Morning mill at Mullan, Idaho, of the Federal Mining & Smelting Co. has a capacity of 1,500 tons of ore per day, producing concentrates containing lead, zinc and silver

THE ore dressing mills of the Coeur d'Alene mining district in the northern pan-handle section of Idaho, after 50 years of steady growth, are now capable of treating approximately 12,000 tons of ore per day in the production of lead, zinc, silver, copper and antimony for the nation's war effort, when supplied with sufficient manpower.

The district is credited by the U. S. Bureau of Mines as being the largest silver producer in the United States, second largest producer of lead and third largest of zinc. The district's zinc production will be greatly increased in 1943, which should put the output in second or first place.

The assessed valuation of mining and milling property in 1943 totalled \$19,304,440, according to Anna K. Battick, county recorder, showing an increase of \$423,325 over 1942.

About 30 mills are now operating in the district within a radius of 30 miles of Wallace, Idaho, the county seat of Shoshone county. Among the larger mills are the Morning, Hecla, Sunshine, Bunker Hill, Page and Hercules. Each one of these plants has a capacity of treating around 1,000 to 1,500

tons of ore a day. The other 24 mills range from 150 to 600 tons. All of them are among the most modern min-

eral concentrating plants in the world, with savings of above 90 percent of the mineral content of the ores treated.

In the early days of the district 60 to 75 percent saving of the mineral content of the ore was considered good



The Sunshine Mine and Mill on Big Creek has a capacity of 1,000 tons of ore per day producing lead, silver, copper and antimony

Mills in the Coeur d'Alenes Increase Metal Supply

About 30 modern and efficiently operated plants provide lead, zinc, copper, antimony and copper concentrates for nearby metallurgical plants.

By H. W. INGALLS

Mullan, Idaho

recovery, with the result that millions of dollars worth of ore went out the tail race into the Coeur d'Alene river and much of it can never be recovered. Many years ago the zinc values were purposely dumped in this way because this metal was "poison" to the smelter operator and brought penalties to the miner.

Milling improvements came gradually, and largely through local experiments, until the introduction of the oil flotation method. This process was first tried out at the Federal Mining & Smelting Company's Morning mill, where McQuestin tubes were installed. This equipment was only a partial pioneer success, principally because of excessive upkeep cost of machinery. At that time not much was known about reagents, or, in other words, the different oils which today aid so materially in the recovery of values in the ores.

The first discovery which showed a difference in results, depending on the reagent used was at the Morning plant, when a shift boss in the McQuestin tube mill unit, after hours of labor trying to make the machines produce the desired results, became disgusted and gave it up. While he was taking a shower bath to remove the muck he had accumulated during his session with the tubes, he got so mad about it that he heaved a bar of soap at the layout. The soap accidentally hit and entered the feed end of one of the tubes and, after a short interval, out of the other end miraculously came the high grade zinc product the machines were supposed to produce. The operator's name was Jocko Harwood. The management immediately made him foreman of the McQuestin tube plant and ordered a carload of soap! Harwood was later killed in France during World War I. The McQuestin tubes proved too expensive on upkeep and were followed by other and less complicated machines, and finally with the Fahrenwald flotation machine, invented and patented by A. W. Fahrenwald, dean of the Idaho school of mines, which has been adopted as standard equipment by the majority of mills of the district.

The only other important change in milling practice in recent years has been the introduction of the H. & H. sink-and-float method. This process originated in England, and was designed to eliminate waste material from the mill feed, thus decreasing the wear and tear on mill machinery and at the same time provide a higher grade product. This process was first tried out in the Coeur d'Alene district in 1939 at the Sullivan Mining Company's Star mill at Burke and proved so successful on the Star ore, that it was adopted by the Bunker Hill Mining & Concentrating Company and has been installed to handle the entire



The Gem Mill of the Hecla Mining Co. has a capacity of 800 tons per day. Metals recovered are lead, zinc and silver



The Polaris Mill at Osborn has a capacity of 300 tons of ore per day and the products recovered are lead, zinc, silver, copper and antimony

output of the mine, about 1,700 tons a day.

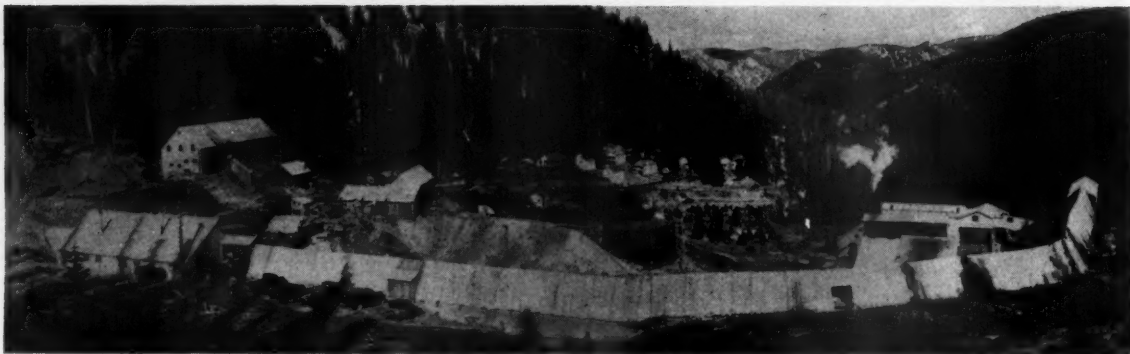
The Hecla company, also, is installing a 2,000-ton daily capacity sink-and-float plant at Osborn to treat a 2,000,000-ton accumulation of zinc-lead tailings.

Other improvements in the ore dressing methods employed in the district include the construction of an electrolytic antimony recovery plant at the Sunshine mill. Faced with a shortage of structural steel and electric equipment, the Sunshine company built this plant out of abandoned highway bridges and discarded street railway equipment. Antimony was formerly a waste product in Sunshine ores and, in addition, was penalized in the smelter treatment. The Sunshine plant now recovers the antimony in commercial form, ready for market, before smelter treatment of the ore for lead, silver and copper values. In addition to its own ores, the Sunshine is treating for antimony the entire output of the Coeur d'Alene Mines company, and any other custom ores offered.

Important factors in the zinc industry of the district are the Sullivan Mining company's electrolytic zinc plant, owned jointly by Hecla and Bunker Hill, and the new Bunker Hill zinc fuming plant, which is a million dollar addition to the Bunker Hill smelter.

The Sullivan zinc plant cost an original outlay of \$3,051,000 and, in addition to treating Sullivan's Star ore, is a custom plant for the entire district. It was the first plant in the United States to produce 99.99+ percent pure zinc on a commercial scale and still produces the purest zinc in the U. S. The plant now employs about 350 men, uses 25,000 h.p. of electricity and produces 3,500 tons of slab zinc and 36,000 lbs. of cadmium per month.

The Bunker Hill zinc fuming plant has been constructed during the past two years at a cost of over \$1,000,000 and is designed to handle hot and cold smelter slag for the recovery of zinc values. This plant was described in the October MINING CONGRESS JOURNAL.



General view of Hermes Camp. The tepee-shaped snow shed has been rebuilt with improved structural design. The mine portal is on the left and the furnace building on the right

The Hermes Quicksilver Mines—Part I

THERE is, at present, only one substantial quicksilver producer in the State of Idaho. It is the second and more important, of the only two such mines in Idaho's history. The property referred to is the Hermes mine of Bonanza Mines, Inc., a company which also operates the better known Bonanza quicksilver mine in Douglas County, Oregon.

The first important Idaho mercury producer was the Idaho Almaden, 17 miles east of Weiser. This Washington County mine was a child of the war, starting operations in 1939 and closing down in 1942. It and the Hermes were equipped with rotary kilns and were, as far as is known to the writer, the only Idaho quicksilver mines ever equipped with large mechanical furnaces. The Idaho Almaden plant, however, is no longer in Idaho. It has been moved and set up at the Polar Star quicksilver mine in San Luis Obispo County, California. The company operating this plant continues under the able management of Lawrence K. Requa.

The Idaho Almaden ore was deposited in silicified sandstone, of which 53,000 tons were treated, yielding close to 6 lbs. of quicksilver per ton. The mine is situated near the Idaho-Oregon line in semi-arid, sagebrush-covered country, similar to much of Nevada and southeastern Oregon. The Hermes, on the other hand, is located in the type of country more typical of mountainous Idaho, in the virgin forest area of Valley County. More specifically, the Hermes is 17 miles by road from the town of Yellow Pine (its post office), 80 miles from Cascade (closest rail point) and, proceeding further west and a good deal further south, 160 miles from Boise, the state capital. Another way of placing the Hermes is to say that it is

A property which produced its first metal for World War I is now a substantial provider of mercury for this generation's struggle in World War II

8.5 miles by road east of Stibnite, post office of the Yellow Pine (tungsten) mine. Certain of the Yellow Pine mine facilities, such as the recreation hall and the store, are available to Hermes residents.

Prospecting for quicksilver is being carried on by various individuals and companies elsewhere in Valley County, as well as in Washington, Cassia, and possibly one or two other central and southern Idaho counties. As an adjunct to this miscellaneous prospecting there may be production from a few retorts. But it is safe to say that the Hermes mine accounts for well over 95 percent of Idaho's quicksilver production, and in fact ranks as the second or third largest producer in the United States.

Material for Hermes history has been drawn from Bulletins 715-E and 780-D of the U. S. Geological Survey, respectively written by the teams of E. S. Larsen and D. C. Livingston, and Frank C. Schrader and Clyde P. Ross and published in 1920 and 1926; from John J. Oberbillig, president of United Mercury Mines Company, and from reports in the possession of the Bradley Mining Co.

The original discovery of cinnabar in the district was made by Pringle Smith in 1902, during the Thunder Mountain (gold) boom. The find was made in a fork of Sugar Creek, the fork being subsequently named Cinnabar Creek. This discovery developed into the original Hermes group: the Pretty Maid, Hermes, Annie Sell, Golden Gate No. 4, Vermillion Ex-

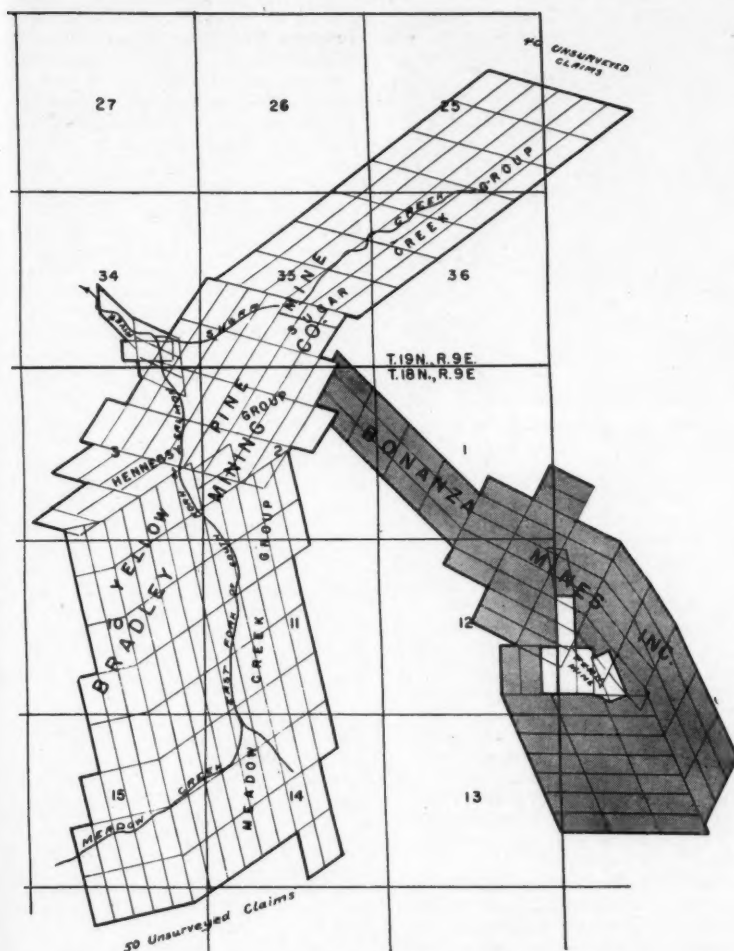


By WORTHEN BRADLEY

President, Bradley Mining Company

tension No. 1, and Vermillion claims, reading from northwest to southeast. These claims were discovered by Smith, who for years had been the only prospector in the district. Prospecting lapsed following this early period, but became stimulated by the high quicksilver prices during the World War. In 1917 E. H. Van Meter located the Fern group, south of the original Hermes group and now encompassed by the expanded Hermes property. During 1917 and 1918 the Fern Quicksilver Mining Company produced 10 flasks and in 1930 four flasks, all from a 2-ton Johnson-McKay bank of retorts.

John J. Oberbillig writes entertainingly of the 1917 Fern operations. During that year the company pro-



Shaded Hermes claims show location near Bradley tungsten claims

duced three flasks. Quoting Oberbillig: "It was quite evident from the amount of ore they had stacked up, that they felt that the Fern should have produced at least 5 or 6 more flasks of mercury. However, Dr. Ustick who was the chief financier of the operations was quite enthusiastic about the actual production, and hung around the plant most of the time. None of the plant operators had had any experience around a mercury plant, and for that reason there were about as many leaks around the plant as there were at the condensing end. Mercury vapor was discernible where it condensed on the ground, on the plant walls, and on the bark of the trees. All of the crew working around the furnace were badly saturated, and Dr. Ustick fell over dead about half an hour before I got to the plant. On one of my visits to the field I called their attention to the mercury fumes escaping all around the end lids of the loading end of the plant."

Oberbillig had charge of Hermes operations for the Monumental Mer-

cury Company in 1918, and installed a series of retort pots for the purpose of testing ore mined during the course of development work. Runs could be made of 500 lb. of ore at a time, and sometimes this was repeated twice a

day. This work was carried on from August until October 15, 1918, and five flasks were produced.

In 1921 Oberbillig took over the Hermes group and installed a larger testing plant: a 6 tube retort capable of treating 1,000 lb. to a charge. This produced 17 flasks from 1921 to 1923. Oberbillig continues: "Then a party by the name of Wilson claimed to know something about mercury reduction and wanted to put in six 'D' tubes which he had made in Boise. After he had his plant installed his scheme didn't seem to work very well, and I told him that it would be advisable to close down, otherwise he would meet with Dr. Ustick's fate.

"In 1924 a gentleman by the name of B. M. Smith had a fool-proof plant which he was going to install at the Fern mine. When he found there was insufficient ore at the Fern, he dickered with me at the Hermes. I told him to go ahead and install his plant provided he would take out the price of the plant from production. This was agreed on, and the fool-proof plant was installed, but was capable of operating only 8 hours. After the heat was applied the plant buckled up, and the drags couldn't be pulled through. That was the end of that operation."

By adding up Oberbillig's figures a known production of 36 flasks can be credited to the Hermes-Fern district, from 1917 through 1930. By adding a few flasks to compensate for what may have been produced but unreported, the production can be said to be 40 flasks prior to the present operations. Of this total, at least 22 flasks are known to have come from Hermes ore.

In 1927 Oberbillig succeeded in interesting the late F. W. Bradley in the district. The interest at that time was primarily in the quicksilver possibilities. Bradley formed the Yellow Pine Syndicate, which later became the Yellow Pine Company, which in turn was absorbed by the Bradley



Looking S. E. from above Hermes portal. Camp construction in left foreground; grading for plant at right background as of August, 1941



Hermes outcrop strikes N. W. up cleared area, upper left. Bunk house being constructed at right during August, 1941

Mining Co. The original syndicate took over the Meadow Creek, Hennessy, and Cinnabar (Hermes) groups. During 1927 and 1928 a small crew under the late C. G. Dennis and the late J. A. White established themselves at the log-built "Cinnabar Camp," and superintended the sampling of some 2,000 ft. of old and new workings northwest from the Hermes portal. Assays were made and tonnages were calculated. The true extent of the ore body was not realized; nevertheless, a substantial body of 7-lb. ore was indicated. This was not considered sufficient at that time for, although the price of quicksilver was over \$120 per flask, the difficulties of access to the property seemed too great. The way to Cinnabar Camp was four or five miles by road from Meadow Creek Camp, up past the Fern Mine toward Monumental Summit, then straight down by trail to the 7,800 ft. elevation of the Hermes portal. At the summit the road intersects one of the old Thunder Mountain trails which come up from Johnson Creek. Empty quicksilver flasks that were optimistically packed in, in the early days, can still be seen scattered along this trail.

To return to Hermes history:

During 1927 and 1928 the Yellow Pine Syndicate started two prospect tunnels, on opposite sides of the East Fork of South Fork of Salmon River, just upstream from what is now the south end of the Tungsten Pit. The project on the west side, named the Monday Tunnel, ranged out several thousand feet into the country rock. From this tunnel, at a later date, some diamond drilling was done which intersected a few low-grade gold, antimony, and scheelite veins. The east side project ran about 1,500 ft. and intersected nothing. It was ambitiously named the Cinnabar Tunnel, being aimed in the general direction of Hermes (approximately three miles needed to get under the Hermes claims).

In 1941 the Hermes property, having

reverted lease-free to the United Mercury Mines Company, was investigated by H. C. Wilmot and associates. Wilmot had been a very successful prospector, developer, and operator of gold mines in Canada (especially in the Bridge River district of British Columbia), in the Philippines, and in Mexico; and from 1939 to 1941 he had boosted the Bonanza Mine (near Sutherlin, Oreg.) into the number one position among United States quicksilver producers. During the latter part of this period he also recommended to his associates the reopening of the old Mt. Jackson quicksilver mine in Sonoma County, Calif. This has also turned out to be a highly successful venture.

Thus it was that when Wilmot recommended the Hermes, active development of that property became assured. An operating agreement was entered into with the United Mercury Mines Company. The Bureau of Mines co-operated in a diamond drilling campaign on the property, at the same time that the new Hermes management was sampling the outcrop and the accessible underground faces. This work proceeded rapidly, and soon con-

firmed a sufficient proportion of the tonnage and grade which Oberbillig claimed for the property. By August, 1941, a rotary kiln and set of condensers had been ordered, and ground was being cleared for the plant. The 64-ft. kiln was delivered in one piece the following month, hauled safely over the tortuous roads by truck and special trailer. George Stonebraker of Cascade was the triumphant hauling contractor. The building of the camp had by this time been largely completed; and erection of the plant soon followed, together with stope preparation underground. The plant was put into operation in January, 1942, and the first quicksilver bottled during the same month.

As time went on it was realized that the ore body was of greater size than at first estimated. And the ore broke very easily, perhaps too easily. Taking these facts into consideration, and with the encouragement of the War Production Board, it was decided to add a second kiln and condensing plant. During the spring and summer of 1942 ground was broken for these additions, adjoining Plant No. 1 to the east. Plant No. 2 was erected and producing quicksilver by September, 1942.

Diesel engines have been furnishing power for the operation. By the end of 1943, however, it is expected that they will be replaced by purchased power. The Idaho Power Company has been stringing 110 miles of 66,000 V. line from Emmett, Idaho, to Stibnite. The five-mile, 11,000-volt connecting leg from Hermes to the Emmett-Stibnite line has already been built. The difficulties of setting poles during the winter have thus been anticipated and forestalled. Perhaps, by the time this is read, the switch will have been thrown.

In the next issue of MINING CONGRESS JOURNAL will be described the underground and plant operations employed at Hermes by Bonanza Mines, Inc.



"Cinnabar Camp" at Hermes portal. Scaffolding at right is over the B. M. Smith retort mentioned in text

Taxes and the Future

An appraisal of the trend of taxation imposed by the Federal Government on industry, small business and the individual. Some adequate allowance should be made for deferred maintenance and development for the mining industry.



By HENRY B. FERNALD*

I THINK we are all in agreement in believing our two major problems are: First, the winning of this war; second, the readjustment for peace.

As to the first, the actual fighting and strategy is the problem for military authorities; our home problem is primarily that of production. Money will not win this war if we do not have needed production. If we get production, we can and will find the money to pay for it; not all during the war, for even if we raise some few billions more of revenue each of the remaining war years, we shall still have an immense debt to be met from post-war taxes. This war can only be paid for if we keep alive our revenue sources of taxation, not throttling, breaking nor discouraging them. We must have, during and after the war, the active flow of business, employment, profits and income from which the Government can derive its needed revenues. We need all we can raise from taxation, but without hurting war production and without unduly sacrificing the future revenues which can only come from the profits and incomes of business and individuals. In speaking of war production, we necessarily include the production needed to maintain as best we can civilian life from the surplus over direct war needs.

As to the second major problem, our greatest concern is that the millions who will return from the war services and the millions who will have to shift from war-time jobs shall have fair opportunity for employment in business activities. They do not want hand-outs or doles, but places in industry where they can stand on their own feet and earn on their merits. That is what we must give to our returning service men and girls if they are to feel we have not fallen down on our jobs while they were doing theirs.

* Presented to the Committee on Ways and Means, House of Representatives, at hearings on the Revenue Revision of 1943, October 12, 1943. Mr. Fernald is senior partner of Loomis, Sufferin and Fernald, New York City, and he appeared as a member of the Committee on Federal Finance of the United States Chamber of Commerce. He is also Chairman, Tax Committee, American Mining Congress.

But employment means employers. To have employers in private industry under a system of individual initiative, employers must have expectation of a reasonable return commensurate with their investments of capital, their abilities and efforts, and the risks involved.

Anyone contemplating employment of others in business must look ahead and estimate the probability in the long run that he can recover all he will spend for salaries and wages, materials and supplies and other charges and expenses of the business, keep capital intact or compensate for losses, and have a net profit remaining, after taxes, sufficient to warrant the capital employed, the risks involved and the abilities and efforts expended. Unless he can see reasonable prospect of doing this, there is no inducement for him to give employment. He certainly cannot ask others to contribute finances unless there is prospect for

reasonable return on the capital employed. If he uses his own money on any other basis, he will probably not long be in the position to give employment.

The net yield is to be measured by what remains to the investor after taxes. Whether investment is in a corporation or a partnership or an individually owned enterprise, the net result is after all tax payments, corporation or individual. Large earnings by a corporation mean little unless we look at the net return to the investor after all taxes; those paid by the corporation and those paid or payable by the individual when and as the profits may be distributable to

TABLE 1
TAX RATES APPLICABLE AT CERTAIN TYPICAL AMOUNTS OF SURTAX NET INCOME OF INDIVIDUALS*

Present Law

Combined normal, surtax and Victory tax rates on investment income (earned income credit not applicable to such income in these brackets); assuming income base the same for normal tax, for surtax and for Victory tax; Victory tax rate at net amount after reduction for maximum post-war credit allowable to married person with no dependents.

Surtax net income bracket	TAX RATES				Total
	Surtax (percent)	Normal	Normal and Surtax	Victory Net	
\$4,000- 6,000.....	20	6	26	3	29
6,000- 8,000.....	24	6	30	3	33
8,000- 10,000.....	28	6	34	3	37
10,000- 12,000.....	32	6	38	3	41
12,000- 14,000.....	36	6	42	3	45
14,000- 16,000.....	40	6	46	3	49
16,000- 18,000.....	43	6	49	3	52
18,000- 20,000.....	46	6	52	3	55
20,000- 22,000.....	49	6	55	3	58
22,000- 25,000.....	52	6	58	3	61
25,000- 32,000.....	55	6	61	3	64
50,000- 60,000.....	66	6	72	5†	77
100,000-150,000.....	79	6	75	5†	90
Over 200,000.....	82	6	88	5†	93

* "Surtax net income" is "net income" less personal exemptions. For example, for a married person with no dependents \$4,000 of surtax net income equals \$5,200 net income.

† Over \$50,000, the 5 percent Victory tax rate is applicable until the 90 percent ceiling is reached.

him. If the corporation can earn 10 or 20 percent but the investor can only see a possible return to him of 2 or 3 percent net after taxes, a prospective investment will have little appeal to him. Whether corporate earnings are absorbed by losses and expenses or are taken by taxes, they will equally disappear so far as net yield to the investor is concerned.

Too little attention has been given to the burden of taxes as a factor in obstructing employment, business enterprise and development and government revenues themselves. To illustrate this, tables are attached which show the weight and effect of the tax burden in typical cases.

Tax Rates Applicable to Individuals

The first step is in Table 1 illustrating the tax rates applicable at certain typical amounts of surtax net incomes of individuals. It has seemed simpler to state this by "surtax net income" brackets. This avoids the need of separate tables for different amounts of personal exemptions. The personal exemptions in any case can be added to get the "net income" brackets which would correspond to the "surtax net income" amounts stated. It is here assumed that in these brackets normal, surtax and Victory tax net income will be the same (differences in exemptions having been absorbed in the lower brackets). Victory tax is taken at net amount after reduction for maximum credit allowable to a married person with no dependents; that is, the net 3 percent up to \$50,000, at which point the maximum credit would have been allowed, so the full 5 percent rate would thereafter apply in these examples (which do not extend to the point where the 90 percent limitation is reached).

The tax rates stated are those applicable to income in the stated brackets. These rates in the separate brackets are those to be particularly considered by one who is contemplating an additional investment.

For example; if a man already has income which would give him \$10,000 of surtax net income, he must recognize that if he receives an additional \$1,000 of income, the tax in that bracket will take 41 percent of it, so his net additional income will be only a little more than half (59 percent) of the additional amount received. For him, 6 percent interest received in that bracket will give a net yield of 3½ percent.

The man whose additional income would fall into the \$50,000 to \$60,000 bracket would have less than one-quarter (23 percent) left him of the additional amount received. For him, 6 percent interest received in that bracket would give a net yield of less than 1½ percent.

TABLE 2

EXAMPLE OF FEDERAL INCOME AND EXCESS PROFITS TAXES ON BUSINESS EARNINGS AT PRESENT RATES

- (1) Corporation taxes, plus (2) individual taxes, if earnings are fully distributed to stockholders.
- (1) *Corporation earnings and taxes*
 - (I) \$80 earnings, taxable at 40 percent—Note (a). See below.
 - (II) \$80 earnings, taxable at 90 percent—Note (b). See below.
 - (I & II) \$160 earnings, taxable ½ at 40 percent and ½ at 90 percent.
 - (III) \$500 earnings, taxable at 80 percent ceiling rate, earning 50 percent on investment—Note (b). See below.
 - (IV) \$1,000 earnings, taxable at 80 percent ceiling rate, earning 100 percent on investment—Note (b).
- (2) *Stockholder's taxes and net remaining*, if earnings were fully distributed and were subject to tax in certain surtax bracket as listed—Note (c).

	(I) 40 percent tax	(II) 90 percent tax	(I & II) 40-90 percent tax	(III) 80 percent tax	(IV) 80 percent tax
Corporation tax rates					
Corporation earnings	\$80.00	\$80.00	\$160.00	\$500.00	\$1,000.00
Corporation taxes	32.00	72.00	104.00	400.00	800.00
Balance remaining	\$48.00	\$8.00	\$56.00	\$100.00	\$200.00

Stockholder's surtax Brackets	Tax rate percent Note (d)	Taxes on Stockholders				
(A) \$4,000- \$6,000	29	\$13.92	\$2.32	\$16.24	\$29.00	\$58.00
(B) 10,000- 12,000	41	19.68	3.28	22.96	41.00	82.00
(C) 18,000- 20,000	55	26.40	4.40	30.80	55.00	110.00
(D) 50,000- 60,000	77	36.96	6.16	43.12	77.00	154.00
(E) 100,000-150,000	90	43.20	7.20	50.40	90.00	180.00

Combined Taxes of Corporation and Stockholders						
(A) \$4,000- \$6,000	.....	\$45.92	\$74.32	\$120.24	\$429.00	\$858.00
(B) 10,000- 12,000	.....	51.68	75.28	126.96	441.00	882.00
(C) 18,000- 20,000	.....	58.40	76.40	134.80	455.00	910.00
(D) 50,000- 60,000	.....	68.96	78.16	147.12	477.00	954.00
(E) 100,000-150,000	.....	75.20	79.20	154.40	490.00	980.00

Net Remaining to Stockholders						
(A) \$4,000- \$6,000	.....	\$34.08	\$5.68	\$39.76	\$71.00	\$142.00
(B) 10,000- 12,000	.....	28.32	4.72	33.04	59.00	118.00
(C) 18,000- 20,000	.....	21.60	3.60	25.20	45.00	90.00
(D) 50,000- 60,000	.....	11.04	1.84	12.88	23.00	46.00
(E) 100,000-150,000	.....	4.80	.80	5.60	10.00	20.00

- NOTES: (a) If corporation had \$1,000 invested for each \$80 of earnings, the earnings would not be subject to excess profits tax.
- (b) This does not take into account the post-war credit, since it may be absorbed by post-war losses or any ultimate distribution of it is too remote to consider in computing yield to stockholders.
- (c) "Surtax net income" represents "net income" less personal exemptions. For example: —\$4,000 of surtax net income represents \$5,200 net income for a married man with no dependents.
- (d) The stated "Tax Rate" is the combined normal, surtax and Victory tax—as in Table 1.

A man whose additional income would fall in the \$100,000 to \$150,000 bracket would only have 10 percent of the additional amount received left him as net income. For him, 6 percent interest received in that bracket would give a net yield of only ⅓ percent.

Examples of Federal Taxes on Business Earnings

Next, in Table 2 are given examples of Federal income and excess profits taxes on business earnings at present rates, taking into account (1) corporation taxes, plus (2) individual taxes if earnings are fully distributed to stockholders. Of course, if the corporate earnings were never distributed to stockholders but were retained subject to the risks of the business and finally absorbed by losses, they would never yield a net return to

the stockholders. If retained by the corporation and so used as to give rise to further income, that income, when distributed, will find its place in net yield computations. There are many possible refinements of these situations which it is impracticable to present in brief tables, which are to be understood as applicable only to the situations as presented, which I believe are fairly illustrative of the general situation.

In considering net yield to stockholders, the post-war credit on excess profits taxes has not been taken into account since it is apt to be absorbed by post-war losses, or any ultimate distribution of it to stockholders seems too remote to consider in computing net yield. In any event, even if taken into account, discounted back to a present value, it would not generally make any material difference in net to stockholders.

Several different situations are here considered. In column (I) the results are shown for a corporation having earnings subject only to the 40 percent normal and surtax; as, for example, where the corporation earns \$80 on each \$1,000 invested, so excess profits taxes would not apply. (In all these examples it is assumed that normal, surtax and excess profits net income are all similarly computed without the various special adjustments which in particular cases might be involved.) Of the \$80 earned by the corporation, \$32 would be taken by the 40 percent tax, leaving \$48 to be distributed. Assuming this \$48 would be distributed to stockholders in various brackets, the table shows the taxes on the several classes of stockholders, running from 29 to 90 percent (as set forth in Table 1). Thus, further amounts of from \$13.92 to \$43.20 would be taken in taxes of stockholders in the cited classes. The next division of the table shows the combined amount of \$45.92 to \$75.20 which would be taken by taxes of the corporation and of the respective classes of stockholders. The final division of the table shows the net remaining to the several classes of stockholders from \$34.08 for those in bracket (A) to \$4.80 for those in bracket (E) out of the \$80 of corporate earnings.

Column (II) follows through with the result of a similar \$80 earned by the corporation, subject to the 90 percent tax, showing how little will remain to stockholders out of that \$80.

The next column (I & II) shows the results for \$160 of corporate earnings, one-half taxable at 40 percent and one-half at 90 percent. Again assuming full distribution to stockholders, the table simply adds together the amounts in columns (I) and (II) to illustrate the relative results in any case where the corporate earnings are one-half exempt and one-half subject to the excess profits tax. Here the taxes have absorbed practically all of the increased earnings so that the net remaining to stockholders in the several classes, is only slightly more than if the corporation had not had the earnings which are subject to the 90 percent tax.

In column (III) are shown the results if the corporation were earning \$500 (50 percent) on each \$1,000 invested (subject to the 80 percent ceiling tax), and the \$100 remaining to the corporation were distributed to the several classes of stockholders noted. As will be seen from the table, the combined taxes of corporation and stockholders of these classes would take from \$429 to \$490 of the \$500 earned by the corporation; so the net remaining to the stockholders would be from \$71 to as low as \$10 out of the \$500 earnings. For example, for stockholders in the class (b) where

TABLE 2-A

NET YIELD TO STOCKHOLDERS FOR \$1,000 INVESTED—IN EXAMPLES OF TABLE 2

(1) Corporation income taxable at 40 percent.

If the corporation earns \$80 (8 percent) on \$1,000 invested by stockholders, and the \$48 (4.8 percent) remaining to the corporation, after a 40 percent tax, is distributed to stockholders, to whom it would be taxable in typical brackets, as stated, the net yield to stockholders in the several taxable classes would be—

	Percent
(A) Stockholder in \$4,000- \$6,000 surtax bracket....	3.41
(B) Stockholder in 10,000- 12,000 surtax bracket....	2.83
(C) Stockholder in 18,000- 20,000 surtax bracket....	2.16
(D) Stockholder in 50,000- 60,000 surtax bracket....	1.10
(E) Stockholder in 100,000-150,000 surtax bracket....	.48

Net yields of from less than 3½ percent to as low as ½ percent would in no case make this an attractive investment. In no case is the net yield sufficient to cover even a minimum business risk.

(I & II) Corporation income taxable½ at 40 percent and ½ at 90 percent.

If the corporation earns \$160 (16 percent) on \$1,000 invested by stockholders, of which one-half (8 percent on investment) is taxable at 40 percent and one-half is taxable at 90 percent, and the \$56 (5.6) percent remaining to the corporation is distributed to stockholders (taxable in stated bracket) the net yield to such stockholders would be—

	Percent
(A) Stockholder in \$4,000- \$6,000 surtax bracket....	3.98
(B) Stockholder in 10,000- 12,000 surtax bracket....	3.30
(C) Stockholder in 18,000- 20,000 surtax bracket....	2.52
(D) Stockholder in 50,000- 60,000 surtax bracket....	1.29
(E) Stockholder in 100,000-150,000 surtax bracket....	.56

Although corporate earnings are here doubled, the net yield to the stockholders is only slightly increased. The net yields of less than 4 percent to as low as ½ percent are not sufficient to cover the business risk.

(III) Corporation income taxable at 80 percent ceiling rate—earnings 50 percent on investment.

Even if the corporation earns \$500 (50 percent) on \$1,000 invested by stockholders, taxable to the corporation at the ceiling rate of 80 percent, and the \$100 (10 percent) remaining to the corporation is distributed to stockholders (taxable in stated brackets) the net yield to such stockholders would be—

	Percent
(A) Stockholder in \$4,000- \$6,000 surtax bracket....	7.10
(B) Stockholder in 10,000- 12,000 surtax bracket....	5.90
(C) Stockholder in 18,000- 20,000 surtax bracket....	4.50
(D) Stockholder in 50,000- 60,000 surtax bracket....	2.30
(E) Stockholder in 100,000-150,000 surtax bracket....	1.00

If this corporation could be expected to continue to earn at this rate, it might be attractive to A, possibly to B, doubtful for C, and not attractive for either D or E.

In any event, there is no leeway for substantial decrease in earnings, to say nothing of losses.

(IV) Corporation income taxable at 80 percent ceiling rate—earnings 100 percent on investment.

As an extreme case, if the corporation earns \$1,000 (100 percent) on \$1,000 invested by stockholders, taxable to the corporation at the ceiling rate of 80 percent, and the \$200 (20 percent) remaining to the corporation is distributed to stockholders (taxable in stated brackets) the net yield to such stockholders would be—

	Percent
(A) Stockholder in \$4,000- \$6,000 surtax bracket....	14.20
(B) Stockholder in 10,000- 12,000 surtax bracket....	11.80
(C) Stockholder in 18,000- 20,000 surtax bracket....	9.00
(D) Stockholder in 50,000- 60,000 surtax bracket....	4.60
(E) Stockholder in 100,000-150,000 surtax bracket....	2.00

If the corporation could be expected to continue to earn at this rate, it would be attractive to A, B and C, doubtful to D and not attractive to E.

Any expected substantial decrease in earnings, any anticipation of serious losses, could readily make it unattractive even to A and B, certainly unattractive to C and D. Even a possible yield of 9 to 14 percent for a few years would not go far to offset possible losses nor to compensate for a decline to a net yield of 4 percent or less.

All of the foregoing examples have been on the assumption that the entire amount of net profits of the corporation, after taxes, would be distributed to stockholders. This is the most favorable assumption for net yield to stockholders. Probably this would not be done. If only part of the earnings were distributed, the net yield to stockholders would be even less than here shown. The undistributed earnings would be subject to all the risks of the business, and might be absorbed by future losses, in which event they would never reach the stockholder.

the surtax rate applicable to the \$10,000 to \$12,000 bracket, of 41 percent, would apply, the net remaining to the stockholders out of \$500 earned by the corporation, would be only \$59, and taxes would have taken \$441.

In column (IV), the assumption is made that the corporation might be earning \$1,000 (100 percent) for each \$1,000 invested. The combined taxes of corporation and stockholders in the stated classes would be from \$858 to \$980 out of the \$1,000 of corporate earnings, leaving to such stockholders net amounts from \$142 to as low as \$20 out of the \$1,000 earnings; taxes having taken \$858 to \$980.

Net Yield to Stockholders

Table 2-A presents these several situations reduced to percentages of net yield to the several classes of stockholders.

In example (I) where the corporation earned \$80 (8 percent) on \$1,000 invested by the stockholders, the net yield to stockholders after taxes would be from less than 3½ percent to as low as ½ of 1 percent. This, in no case, would be a net yield sufficient to cover even a minimum business risk.

In example (I & II) where the corporation earns \$160 (16 percent) on \$1,000 invested by the stockholders, one-half taxable the corporation at 40 percent, and one-half taxable at 90 percent, the net yield to stockholders would be from less than 4 percent to slightly more than ½ of 1 percent, again not sufficient to cover business risk and be attractive to investors.

In example (III) if the corporation earns \$500 (50 percent) on \$1,000 invested by stockholders, with the corporation taxable at the 80 percent ceiling rate, the net yield to stockholders in the stated classes would be from 7.10 percent to as low as 1 percent. If there could be any reasonable expectation that the corporation could continue for any extended period to earn 50 percent on the monies invested, the net yield of slightly more than 7 percent might be attractive to stockholders where the income would fall only in the \$4,000-\$6,000 surtax bracket; possibly the yield of slightly less than 6 percent might be attractive where the income would be taxable in the \$10,000 to \$12,000 bracket. However, investors would pause to consider seriously the risks in expecting a corporation to earn 50 percent on the investment in order that the stockholder might receive a net 6 percent which we may here assume is a minimum reasonable return on an investment of that kind and character. Can the investor hope that the corporation will earn, on the average, eight times a reasonable return on capital employed in order to give to the stockholder what is a reasonable return on his investment?

Then, the stockholder will have to consider the possibility of losses or substantial decreases in earnings which would curtail, or even wipe out for some years, any current yield to him. A net return to the stockholder of 6 percent in good years does not leave much margin for losses in poor years.

In example (IV), if a corporation earns \$1,000 (100 percent) on \$1,000 invested by stockholders, with the corporation taxable at the ceiling rate of 80 percent, and distributes the remaining \$200 to its stockholders in the stated classes, the net yield to such stockholders would be from 14.20 percent to as low as 2 percent. Of course, if the corporation is expected to continue to earn this rate, the investment would be attractive to the stockholders where the income would fall in tax brackets as high as those on \$20,000 a year with 9 percent net return, but not even earnings by the corporation of 100 percent a year on investment would give to stockholders, where the income would fall in brackets above \$50,000 a reasonable net yield from the investment. If we were disposed to consider 8 percent as the reasonable net return to the stockholder for such an investment, we can hardly expect that in many, if any, cases the corporation could expect to continue year after year to earn 12½ times a reasonable net return to the investor.

We have no thought that business enterprises can regularly earn 50 to 100 percent a year on invested capital, yet such earnings as these would be necessary under present tax laws, to make investments generally attractive to stockholders whose income would run into even \$10,000 or \$20,000 brackets.

It is not possible to get the investment money needed to form and develop the new enterprises we must have, and to reconstitute existing enterprises, from the stockholder or from investors whose income would be only in the lower tax brackets; yet under present tax rates, we virtually bar from investment the funds of those in the higher tax brackets, because they could not hope to obtain net return which would cover the risks involved.

We ask you to think what this will mean as to employment. Think also what it will mean to government revenues, if those in the higher income brackets have no incentive for making incomes which will be subject to tax and will yield government revenues.

We also ask you to consider what this will mean to the young men, some of them returning from war service, who want to go in, as their fathers or grandfathers might have done, to try, perhaps with little capital but much energy, determination, hard work and ability, to build up a busi-

ness and to give employment to others. If such young men must look ahead and see that if they are successful in developing a business, there is no possibility under the tax laws for them ever to get any net returns commensurate with the energy, ability and risk required, we cannot expect them to try to do this, unless we can have this continued influx of new energy and ability in business enterprises, we will see our whole industrial system die of dry rot. We cannot look for it to be maintained solely by existing enterprises, and we would not want to see this done if we could expect it.

We believe not merely that present rates threaten business enterprise, but we also believe they pass the point of productivity to the Government. We do not believe that in the long run any increase in tax rates on \$10,000 or more of individual income will yield additional revenues to the Government; rather, we think that in the interests of revenue alone there should be reduction in the higher rates.

It is not solely the question of revenues for this year or next. It is the long run revenues that we must depend upon to pay for this war.

In all these examples, there has been the assumption that earnings which remain to the corporation after taxes will be fully distributable to the stockholders. This assumption was adopted to get maximum figures for yield to stockholders. Actually, we cannot expect this. Today, in particular, we know that for most corporations, any excess earnings are largely represented in increased working and plant assets. Often these accumulations of earnings have been supplemented by borrowing, which, to a considerable extent at least, must be paid off ahead of distributions to stockholders, or of any but minimum distributions. Corporations which have large borrowings place the stockholders' equity in jeopardy, for a relatively small shrinkage in asset values may wipe out all or may greatly reduce stockholders' equity.

Net Income Retained by Corporations

Secretary Morgenthau made reference (page 7 of Hearings, Unrevised) to an estimated \$11 billion which corporations will have added to their capital out of earnings during the three years 1941, 1942 and 1943. Mr. Paul submitted (page 103 of Hearings, Unrevised) a table "Net income, income taxes and dividends of Corporation returns, 1936-1944" ALL RETURNS, which shows the basis for these estimates. (Another table giving somewhat different figures appears on p. 128, but that on p. 103 seems later, and so it is used.) This table shows Item 13 "Net Income Retained After Taxes and After New Dividends Paid."

	In mil- lions
1941 actual	\$2,478
1942 estimated	4,000
1943 estimated	4,550

Total net income re-
tained, 1941-1943 .. \$11,028

This same table shows the results
for prior years:

1936 actual	— \$800
1937 actual	— 960
1938 actual	— 1,742
1939 actual	199
1940 actual	587

Net impairment for 5
years, 1936-1940 .. —\$2,716

If from this net impairment for the years 1936 to 1940, \$2,716, we subtract the net retained for 1941 (actual) \$2,478, the net result for the six years 1936 through 1941 is net impairment of surplus for all corporations, \$238.

This showing of net impairment for the six years for which actual figures are given, is quite different from an estimated 11 billion dollar surplus retained for the three years 1941, 1942 and 1943.

In any event, the statistical figures for estimated additions to capital out of earnings do not represent liquid cash resources. Many corporations, under government urge or demand, have vastly increased their working and plant assets using all surplus accumulations and often all they could borrow to do so. Such assets are not now, and may not become in the post-war period, promptly available cash for post-war requirements, and there is no assurance that such accumulations will ever be distributable to stockholders.

Of course, average figures do not reflect the situation of individual enterprises. Some undoubtedly will have accumulated funds available for post-war needs of reconstruction and re-employment and to meet post-war losses. Others, probably the majority of corporations, will not have the surplus funds available. We cannot hope to give needed post-war reemployment unless business corporations can readily obtain new investment money.

It is estimated that on the average, it requires \$5,000 of investment in industry to give employment to one man. Unless we can open the doors for business investment, we cannot hope to provide employment for the millions that will need employment after this war. Present tax rates seem rather effectively to close most doors to business investment.

Deferred Maintenance and Development Expenditures

In this connection, there is the problem of deferred expenditures for maintenance, upkeep and development. With shortage of materials, labor and machinery, there is a general situa-

tion of under-maintenance of plant and equipment. Repairs which would normally be made currently are being deferred. This is unavoidable. If money not spent today could be held to be spent in the future when men and materials are available, it would help to give employment later. The trouble is that under our tax laws there seems no provision for deduction for deferred maintenance. If maintenance and repairs are kept up to date, the money spent is deductible in computing taxable income, but the unspent dollars are not deductible. They are treated in effect as taxable income and the Government takes 40 to 90 percent of them. When the Government takes 90 percent of the dollars not spent this year, these monies are not available for future use to make good the accumulated under maintenance and to give desired employment.

This situation as to under-maintenance of plant and equipment is general in industry. A similar situation exists as to under-development of mines where it is impossible today to keep the development up to date to insure continued operation, and the 10 cents on the unspent dollar left to the taxpayer will not enable the needed work to be done later when it is possible to do so. Some adequate allowance should be made for deferred maintenance, upkeep and development, if we are to do the needed work when material and labor become available.

Estimates of Income Distribution

The table which Mr. Paul submitted (page 21 of Hearings, Unrevised), gives the estimated distribution, by income classes, for income payments as defined by the Department of Commerce. This was submitted as bearing particularly on the inflation question. It shows on its face that its figures are not those for estimates of taxable net income of taxpayers in the various classes, yet some of the discussions seem to have ignored this distinction. In the higher brackets particularly, taxable net income after allowable deductions, would undoubtedly be substantially less than the total "income payments" there shown. It is probable that the net income figures, if available, will show that there is little if any additional revenue to be obtained in the higher income brackets. Secretary Morgenthau and Mr. Paul, I believe, have told you that the only available source for substantial additional revenues is the incomes in the lower brackets. This, is true regardless of the form and nature of taxes which may be imposed. We have already expressed the belief that the taxes in the higher brackets have passed the point of productivity and additional revenue should come from a decrease rather than an increase in those rates. In saying this we are

quote conscious of the greatly increased tax load which has now been placed on lower incomes which for so many years were not paying direct income taxes, although they did bear the substantial load of indirect taxation. We are not trying to urge you to place additional burdens on those taxpayers, but are agreeing with the Treasury that the lower incomes constitute the only source from which substantial additional revenues can come, although the Treasury does not seem to have made its recommendations in accordance with its convictions in this regard.

Conclusion

Present income tax rates make almost impossible any hope for business investments which will be needed to give employment and to give long-term government revenues. Under our system of private initiative, ample employment and government revenues can only come if our tax laws allow to employer and investor opportunity for a net yield after taxes which will be commensurate with the capital employed, the risk assured, and the ability and energy given.

During war years we can count much on patriotism to offset risks assumed and low net returns to investors, but that is no reason why we should not, even in war, deal fairly with investors and employers. This we are confident your committee intends to do, and this discussion has aimed to place before you the picture of the cumulative tax burden upon business and investors under existing law.

Most important of all is the bearing of this picture upon post-war employment. This needs to be considered now. We cannot afford to wait until the war is over and then start in to recast our tax laws so they will not obstruct investment and employment. We should immediately remedy those provisions of our law which have present effects detrimental to post-war employment. We should frame as promptly as possible the tax laws which will apply when hostilities cease so business enterprises and investors can make their plans and be ready, as soon as the war is over, to meet as fully as they can the tremendous post-war employment problem.



A Proposal For International Bimetallism

Leading nations of the world are urged to adopt this type of world monetary standards which would have many advantages in the post war world economy with or without the use of an international stabilized fund.

A NATION can never be healthy when its currency depreciates sharply and fluctuates erratically in value from day to day. We have only to remember the economic chaos and human misery that spread over the continent of Europe after the first World War, before currencies were stabilized, to realize that people must have confidence in the money they use if industry and agriculture are to function normally and employment provided the people.

If the purchasing power of a nation's money, be it the dollar, pound or any other unit, is declining rapidly, so that prices of goods soar skyward, an economic collapse, unemployment and social unrest will inevitably follow. When the foreign exchange value of a currency depreciates, international trade cannot be conducted along orderly lines and high trade barriers that choke commerce are the result.

At the end of the present global war, what will be the purchasing power of the moneys of France, Belgium, the Netherlands, Poland, Norway, Czechoslovakia, Denmark and Yugoslavia, inflated as they have been under German occupation? What will be the buying power of the currencies of the defeated Axis nations, Germany, Italy, Hungary, Rumania and Bulgaria? Can the internal economies of these nations and of the countries of the Far East, China, the Dutch Indies, the Malay Peninsula and Japan, revive while their peoples use highly inflated moneys of doubtful value? Can international commerce with these countries, and between them, be resumed on a large scale without monetary stability?

Every business man knows that an early, effective stabilization of their moneys is an urgent and absolute prerequisite to both internal recovery and the revival of the foreign trade of these countries. The need for such immediate currency stabilization has been recognized by the governments of the United Nations, representatives of whose treasuries have been conferring continuously during recent months to evolve a plan to assure the earliest possible stabilization of cur-

rencies through international agreement.

The need for monetary stabilization is clear. International collaboration is required to achieve it. We must make sure, however, that the standard adopted to assure such stability is sound and adequate, so that stabilization will be lasting.

Why We Must Return to a Metallic Standard

We all know that the international gold standard broke down during the thirties. This largely resulted from the unsound provisions of the peace treaties following World War I, which made the monetary gold stock of the world inadequate. Economic nationalism, reparations and war debts and other consequences of these peace treaties finally caused so marked a maldistribution of existing gold among the nations of the world that survival of the gold standard became impossible.

The use of the precious metals as standard money is one institution which has worked well through the ages. Gold and silver have been used as money in ancient, mediaeval and modern times. Peoples have learned to have confidence in gold and silver coins, and in monetary units that are anchored to gold and silver and are convertible into these metals.

On the other hand, the nations of the earth have had repeated unhappy experiences with paper money. Hence mankind has always preferred "hard money." In our own Civil War of the 1860's, United States paper currency fell to a substantial discount and, when peace came, there was an insistent demand to "resume specie payment."

History abounds in examples of paper moneys deteriorating in value and at times becoming worthless as the result of wars, revolutions and other vicissitudes of the issuing nation. But we do not have to turn to history for examples of the unhappy consequences of inconvertible paper money issues. We have only to look at the nations of Europe and China today to see the tragic consequences



By FRANCIS H. BROWNELL

Chairman of the American Smelting and Refining Company

when they are flooded with huge issues of paper money rapidly depreciating in value towards the point of worthlessness.

Is There Enough Gold?

Extended periods of monetary stability in the past have been invariably associated with the use of the precious metals, gold and silver, as monetary standards.

The international gold standard was dominant in the leading countries of the world through most of the nineteenth century and the period down to World War I. Many urge a return to it after the war. But that standard had broken down long before the present war began. Gold has disappeared from circulation and the price had been increased from \$20.67 to \$35 an ounce, thus in effect increasing the volume available. This failed to solve the difficulty, however.

The monetary gold stocks of the world, according to the best available estimates, do not greatly exceed \$30,000,000,000, at the prevailing price of \$35 an ounce for the yellow metal. The monetary gold stock of the United States amounts to \$22,000,000,000, which is more than 70 percent of the world stock. Obviously, the \$8,000,000,000 or so of monetary gold owned outside the United States is very far from adequate to permit the other nations of the world to return to any type of workable gold standard.

Furthermore, it is not enough that each nation have some gold to make the international gold standard workable. Each country must have a gold reserve that is large enough to take care of adverse contingencies as they arise. A nation should be in posi-

tion to export a considerable quantity of the yellow metal, to cover a temporary deficit in its balance of international payments without being forced to suspend gold conversion and abandon the standard.

How much yellow metal would be needed to make possible a lasting return to the gold standard by the peoples of the world after the war?

The amount of gold reserve desirable for each country will depend upon its price level at home and the volume of trade and other transactions that it carries on with other countries. The higher the price level, the larger the gold reserve required for domestic purposes.

After the war, commodity prices probably will be higher than before the conflict, since a drastic deflation would not help reconstruction. The expressed policy of the British government, as stated by Sir Kingsley Wood, Chancellor of the Exchequer, in his 1943 budget speech before the House of Commons, is to retain the then price level after the war, and this level was 60 percent higher than it was in 1939. Similar considerations will probably cause this country to follow the same course and seek to maintain the existing wage and price levels in the post-war era.

The larger a nation's foreign trade and financial transactions with other nations, the greater the metallic reserve required for these purposes.

It is essential for the welfare of the peoples of the world that foreign trade after the war should be far larger than in the pre-war period. The general determination of nations to lower trade barriers, develop economically backward regions and cooperate in global reconstruction all point to a vast expansion of commerce between nations. The larger the volume of such trade, the greater the disequilibrium that may develop in the balance of international payments in any one year, and so the larger the amount of gold needed in any attempted return to an exclusive gold standard. Hence, regardless of the fact that the gold stocks sufficed for the world's needs for a monetary metal to settle international balances before 1914, and for a few years in the 1920's seemed adequate with the help of the artificial mechanism known as the "Gold Exchange Standard," plus large foreign loans by the United States, there is every reason to believe that a serious shortage of gold for post-war needs looms ahead. This shortage will arise even apart from the fact that the existing supply of the yellow metal is so unequally distributed among the nations of the earth. What is evidently required, therefore, is the expansion of the present monetary gold stock through the addition to it of the other great monetary metal, silver.

The White and Keynes Plans

Recognizing that the inadequacy of the present gold supply, and the small gold holdings outside of the United States, bar a general return to the gold standard after the war, the American and British governments are preparing plans for economizing on the amount of gold required to achieve monetary stability. These plans, and the *American White Plan* in particular, are nothing more or less than efforts to return to a partial international gold standard with a smaller amount of gold. The Keynes Plan does not necessarily require any gold. The International Stabilization Fund, under the White Plan, would give each nation a considerable credit on its books against which only a fractional deposit of gold need be made. Both plans are, in effect, types of managed currency.

Commentators on these plans, almost without exception, have pointed out, however, that when a country's maximum credit on the books of the proposed International Stabilization Fund has become exhausted, the same problem will arise as when gold holdings are all exported under the international gold standard. The inadequacy of the medium for settling international balances will thus again become apparent.

If a plan like the White or Keynes schemes is ultimately adopted, therefore, every practical measure should be taken to increase the ability of a nation to maintain its credit balance on the books of the International Stabilization Fund, and thus the stability of its currency, even though its balance of international payments turns unfavorable for a considerable period of time. This calls for an expansion of the volume of settlement media beyond the limit imposed by the amount of gold available.

Asia and Africa

Both the single gold standard and the White and Keynes plans ignore the preferences of the silver-using peoples of Asia and Africa. The humble status of countless individuals devoid of banking facilities or without need of them, who use the rupee, the yuan or the tael as their medium of exchange and as their store of wealth, makes silver the most desirable coinage for their needs. Unlike gold, silver can be minted into coins of small denominations adequate to the modest requirements of myriads of farmers and tradesmen who, from one year-end to the other, seldom earn through hard labor more than \$100 in our money. Nor will they willingly accept paper currency, which they distrust for many reasons, not the least, if the latest, of which is the experience of China. The average Asiatic does not aspire to the possession of gold,

which is beyond his reach. Silver is what he wants, because silver is the gold of the masses.

Any post-war monetary system must recognize the situation of these people, who constitute approximately one billion human beings or nearly one-half of the estimated population of the earth. The importance of this section of the world in the future from a commercial standpoint will be much greater than in the past.

International Bimetallism

Silver has been in use as a monetary metal as long as gold, and over a large part of history and a large portion of the earth's surface it has been preferred to gold.

Before 1816 all countries, and until the 1870's all countries except England, had a bimetallic monetary system. But they never established identical ratios between gold and silver. When transportation improved, this difference in ratios led to arbitrage. When gold was overvalued, gold coins were melted down or exported, and silver became the sole money in use. When silver was overvalued, it was driven out of circulation by gold.

Economists have pointed out right along that this basic difficulty encountered by bimetallism would not arise if the same ratio were adopted by the leading commercial nations of the world by agreement at the same time. The great English economist, Alfred Marshall, probably the outstanding social scientist in the English-speaking world of the past century, said in his great work on Money Credit and Commerce, "An agreement entered into by all the commercial countries of the world to keep their mints open to gold and silver at almost any reasonable ratio would tie the values of the metals to that ratio, so long as the agreement lasted." He urged that currencies be made convertible into gold and silver together, with an ounce of silver considered equivalent to one-twentieth of an ounce of gold.

The world's monetary gold stock today is less than 1,000,000,000 ounces, of which the United States owns more than 70 percent. The world's monetary silver stock is well over 5,000,000,000 ounces, of which the United States holds approximately half. Were the nations of the world to agree upon international bimetallism, with a fixed and permanent ratio of 20 to 1 established between silver and gold, as Marshall suggested, there would be an immediate increase of more than 25 percent in the aggregate stock of standard money. If we take the countries outside of the United States alone, their holdings of standard money would be increased by some 50 percent! A ratio of 10 to 1 would double the above percentages. But the actual ratio should be determined

by a commission advised by experts—economists, bankers, geologists, mining engineers and others qualified—after full investigation of the many factors involved. They should particularly consider the amount of metallic money desired and the possibility of increased silver production at various price levels.

In this connection, it is interesting to note that in 1940, the last year for which full statistics were made available, the world produced about 41,000,000 ounces of gold and about 273,000,000 ounces of silver. The production ratio was thus approximately seven ounces of silver to one ounce of gold in that year.

Advantages of International Bimetallism

The adoption by international agreement of International Bimetallism as the world's monetary standard, with or without the use of an International Stabilization Fund to economize on the use of monetary metals in settling international balances, would have the following far-reaching advantages:

1. The volume of standard money would be immediately increased, particularly outside of the United States, to meet the larger needs of the post-war world. This would enable nations to maintain the stability of their currencies even if an adverse balance of payment should compel substantial shipments of gold and silver for a time to other nations, or to the International Stabilization Fund.

2. The yearly addition to the world's stock of standard money would be expanded, for the normal annual output of some 40,000,000 ounces of gold would be supplemented by production of some 270,000,000 ounces of silver.

3. The stock of monetary metal could be expanded further, if found necessary, through drawing in considerable quantities of silver from the arts.

4. Nations whose populations desire would be able to restore the coinage of standard money on a large scale. This has become progressively less possible as the gold shortage has caused all governments, including the United States, to withdraw the yellow metal from circulation.

5. If a world-wide shortage of standard money should again threaten, it could be corrected through stimulating silver production and lowering the ratio of silver to gold by international agreement.

6. The adoption of International Bimetallism would not make the International Stabilization Fund Plan unnecessary, but would rather help assure the success of any such plan by facilitating each nation's ability to replenish its credit on the books of the International Fund through its power to deposit silver, as well as gold, for the purpose.

7. This is the only monetary plan that assures the world at large will possess an adequate stock of monetary metals, no matter how large domestic and external trade becomes,

and no matter at what points world prices are stabilized.

8. A much larger number of nations would be themselves producers of standard money under International Bimetallism, and thus would be aided in maintaining the stability of their currencies through the production of monetary metals within their borders. The western hemisphere, chiefly Latin America, produces about three-fourths of the world's silver, while the eastern hemisphere turns out about three-fourths of the gold.

The United States should support international bimetallism because, without lessening or impairing the use of gold or damaging the monetary situation in any country, such a system would serve best its economic interests and those of the western hemisphere.

International bimetallism will escape all of the disadvantages that arise when any one nation resorts to the use of two standard monetary metals, instead of gold alone.

International bimetallism retains every advantage of the gold standard, but possesses a number of additional advantages over gold.

The end of the war and the launching of a cooperative effort by all nations to restore monetary stability with the return of peace provides an unparalleled opportunity to bring this superior international monetary standard into effect, thus assuring a more effective and lasting monetary stability in the post-war world.



U. S. TREASURY, WASHINGTON, D. C.

An Ounce of Prevention...

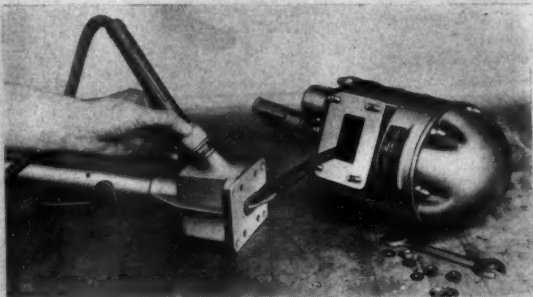


ASSURES TONS OF COAL

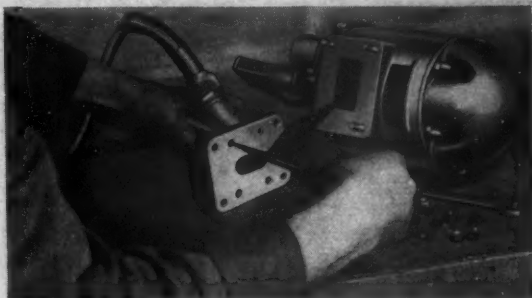
CP Hand-Held Electric Coal Drills require a minimum of simple attention to keep them in good running order.

Replace damaged gaskets and keep all nuts tight to prevent the infiltration of coal dust and the loss of lubricant. Do not neglect a faulty electric connection. Inspect switches regularly. Keep the cable free of grease and oil... and never carry a drill by the cable.

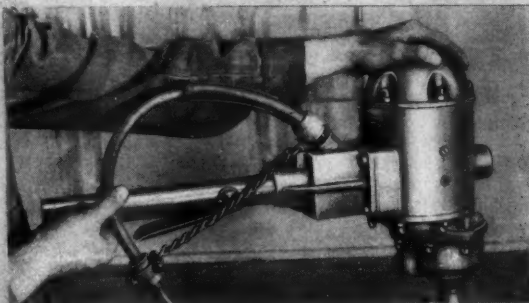
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- 1** To replace cable or switch, loosen cable protector and clamp-nut to release cable.



- 2** Inspect switches regularly. Plate and gaskets are seals — keep tight and in good condition.



- 3** Never carry or drag a drill by the cable. Keep cable strain relief in the arc shown.



- 4** Always keep rubber cables free of grease and oil, otherwise they will swell and rot.

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Standard Trolley Wire Sizes and Shapes

STANDARD shapes and dimensions for hard drawn copper trolley wire, approved in 1940 by the American Society for Testing Materials and the American Standards Association, have been adopted by all of the leading wire manufacturers and trolley wire purchased today is made in accordance with the shapes and sizes as specified. Bulletins published by associations, as well as catalogues of manufacturing companies, give complete data for the standards, but a number of mining companies appear to be unfamiliar with these specifications, which frequently results in confusion when wire and fitting orders are placed. The purpose of this article is to set forth briefly what the standard specifications include and the extent to which interchangeability of fittings is possible; covering four shapes of trolley wire: Round, Figure 8, Grooved, and Figure 9 deep section, grooved.

Round Wire

In recent years the demand for round trolley wire for mine use has practically ceased and it has been almost entirely superseded by the Figure 8, Grooved, and Figure 9 deep section. This change was brought about by the fact that the lower or contact surface of a trolley wire should present a smooth and unbroken surface for the passage of the current collector, be it wheel or slider. As it is not possible to securely hold round trolley wire in the jaws of any type trolley clamp without interfering with the passage of the collector, the reason is very obvious why the other shapes have been preferred.

The round trolley is used extensively by street and industrial railways and is manufactured in sizes ranging from 1-0 to 300,000 C.M. Complete data and specifications covering tensile strength, materials, dimensions and permissible variations will be found in the American Society for Testing Materials, Copper Trolley Wire Specification B47-39, and approved by American Standards Association as E4.6-1940.

Outlining standard specifications for sizes used in mining service; explaining the interchangeability of fittings; and emphasizing the necessity of using the standard designations on orders for line material

By A. L. JOHNSTON

Figure 8 Shape

This style of wire is still used by a number of the coal mining operations in preference to the grooved shape wire—one of the advantages being that the top lobe (to which the trolley clamps are attached) is located a considerable distance above the lower or contact surface of the wire, thus providing an unobstructed passage for the trolley wheel or other style current collector. Some of the disadvantages, however, of this shape wire are:

1. The difficulty in removing from the reel, as there is a tendency of the wire to twist or kink on account of its peculiar cross-section.
2. Considerable trouble is encountered when replacing this wire after slate fall on account of the difficulty of removing kinks and also preventing twists between adjacent hanger and clamp supports.
3. It is more difficult to support the wire on a curve installation owing to the tendency for the upper lobe to roll out of the clamp jaws, as the bottom lobe is entirely unsupported.
4. Formerly the purchaser had no assurance as to the exact shape of the wire he would obtain, as there was no standard and each manufacturer furnished their own style of wire. This difficulty has been overcome and it is now possible to specify wire to be furnished in accordance with A.S.T.M. specifications.

In the last few years the demand for anything smaller than the 4-0 size has practically ceased in mining service, but Figure 8 wire, however, is still available in the 1-0, 2-0, 3-0, 4-0 as well as 350,000 c.m. sizes.

Trolley clamps which support this wire can be used interchangeably on the different sizes; however, it is necessary to specify wire size when ordering trolley splicers or other fittings, such as frog tips.

Table 1 shows general data for the 4-0 and 350,000 c.m. sizes and American Society for Testing Materials, Specification B116-40, includes much additional information on this particular shape wire.

Grooved Shape

This style wire is used extensively by coal and other mines. It has all the advantages of the round wire and also has the added feature that it can be supported by trolley clamps which engage only the top lobe of the wire, thus leaving the lower surface unobstructed for the passage of the wheel or other current collector.

This wire can be reeled or unreeled without difficulty and can be replaced very easily in the supporting trolley clamps; for example, after a slate fall. It does not have a tendency to roll out of the clamp jaws in curve construction, as is the case with the Figure 8 shape.

The tendency in the last few years is to use trolley wire of larger diameter on account of less drop in voltage, and demand, therefore, is mostly for 4-0 and larger, although 3-0 and 2-0 are manufactured. Table 2 gives general data on the three sizes commonly used in mining service and attention is called to the fact that the width and angularity of the top lobe is the same for the 4-0 and two larger sizes, thus making it possible to utilize trolley clamps of one type.

The only difficulty that has been encountered in the large or 350,000 c.m. size, which has a diameter of approximately $\frac{1}{2}$ in., is in the large cross section of trolley-wire splicer or other fittings that encircle the wire. The diameter of these fittings being greater than that of the groove in the trolley wheel, causes an arc when the wheel passes over such fittings and there is also a tendency for the wheel to fly off the wire at these points unless speed of the locomotive is reduced.

Theoretically, as well as actually, for the best performance between collector and trolley wire, the limit in size of grooved wire would be about 300,000 c.m., and in order to use wire of the larger cross-section it is necessary to depart from the cylindrical shape of the grooved wire and resort to Figure 9 deep-section wire, which will be described in following paragraphs.

A. S. T. M. Specifications B 47-39, A.S.A. H4.6-1940 for Grooved Wire are available and reference to same should always be made when purchase orders are placed. This will insure wire of proper dimensions being received and for which trolley-wire fittings are designed.

Figure 9 Deep Section

This oval-shape wire when originally put on the market was referred to by various designations, such as No. 9, 9-0, Style 9, etc. The A.S.T.M. now designate this particular shape wire as Figure 9 Deep Section Grooved—any other reference, therefore, is incorrect and misleading.

The top lobe of the original Figure 9 deep section as first manufactured did not conform to the top lobe dimension and groove angularity of a standard grooved trolley wire; this, however, has been rectified by the adoption of the same top lobe and angle groove as the standard grooved shape, referred to previously. This has eliminated the necessity of having special trolley clamps for Figure 9 wire and one style of clamp will hold equally well either the standard grooved trolley wire or the Figure 9 deep section. (See Tables 2 and 3.)

The advantage of this particular shape wire lies in the fact that it is possible to obtain wire of sufficient cross section and area for maximum current-carrying purposes without increasing the width to the point that the fittings would be objectionable on account of their diameter.

Figure 9 wire is now available from all trolley wire manufacturers in two sizes—350,000 and 400,000 c.m.—and Table 3 gives the general data on these sizes. It is possible to operate standard grooved trolley wheels or sliders with the 400,000 c.m. size, including the fittings, without any difficulty, which is the reason why this

shape wire has become so popular at a number of mines who insist on large diameter trolley conductors to prevent excessive voltage drop.

Specifications covering the manufacture, shape dimensions and tolerances, method of packing and shipping, inspection, cause for rejection, etc., are all included in A.S.T.M. Specifications B116-40.

than those covered by A.S.T.M. specifications—sizes larger than 4-0 being limited to 300,000-350,000 or 400,000 C.M. area capacity. Provided a 6-0 trolley wire were manufactured, it would have an area of approximately 336,000 C.M., and usual practice of the mills when receiving orders calling for a 6-0 trolley wire is to ship the 350,000 C.M. size. It is recom-

STANDARD SECTIONS OF TROLLEY WIRE

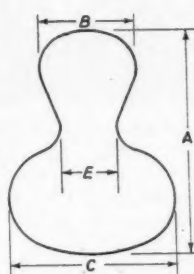
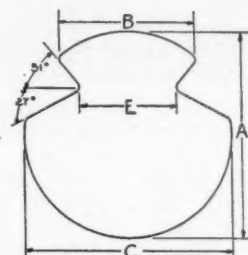


Fig. 8



Grooved

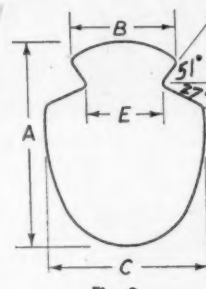


Fig. 9
Deep Section

TABLE 1—A. S. T. M. SPECIFICATIONS FOR FIGURE 8 TROLLEY WIRE

A.W.G.	Area		Dimensions, inches				Volt loss per ampere per 1,000 ft. of trolley wire	Weight per 1,000 ft.
	Nominal cir. mil.	Square inches	A Section depth	B Upper lobe width	C Lower lobe width	E Web thickness		
4-0.....	211,600	.1662	.600	.250	.450	.150	.05044	640.5
	350,000	.2750	.754	.300	.570	.185	.03049	1,060

TABLE 2—A. S. T. M. SPECIFICATIONS FOR GROOVED TROLLEY WIRE

A.W.G.	Area		Dimensions, inches				Volt loss per ampere per 1,000 ft. of trolley wire	Weight per 1,000 ft.
	Nominal cir. mil.	Square inches	A Section depth	B Upper lobe width	C Lower lobe width	E Web thickness		
4-0.....	211,600	.1665	.482	.376	.482	.267	.04992	642
	300,000	.2355	.574	.376	.574	.267	.03529	908
	350,000	.2758	.620	.376	.620	.267	.03014	1,063

TABLE 3—A. S. T. M. SPECIFICATIONS FOR FIGURE 9 DEEP SECTION TROLLEY WIRE

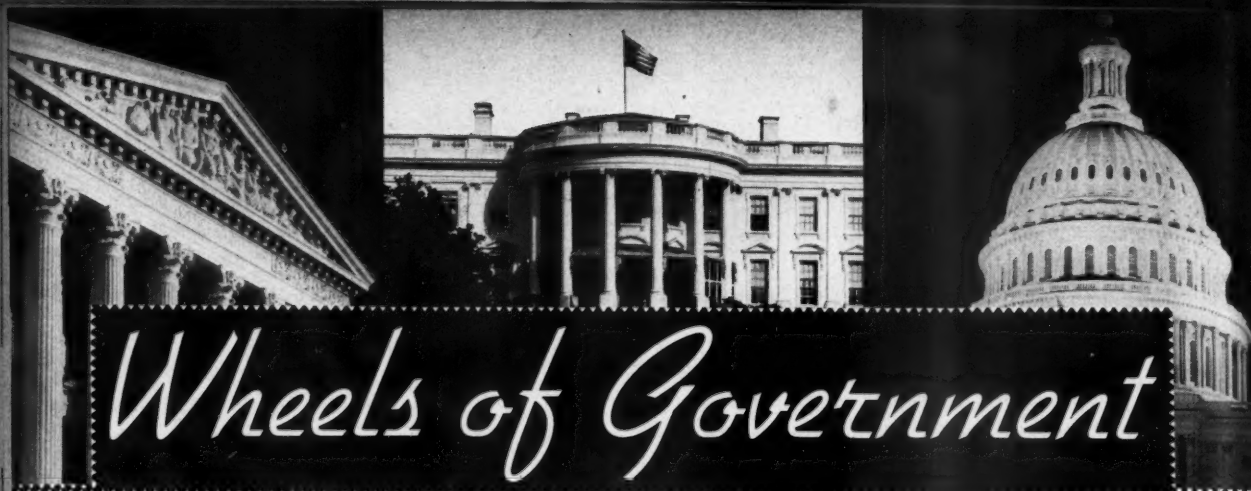
Nominal	Area		Dimensions, inches				Volt loss per ampere per 1,000 ft. of trolley wire	Weight per 1,000 ft.
	cir. mil.	Square inches	A Section depth	B Upper lobe width	C Lower lobe width	E Web thickness		
350,000		.2740	.707	.376	.496	.267	.03960	1,056
400,000		.3120	.745	.376	.552	.267	.02687	1,202

Conclusion

Attention is called to the fact that for trolley wire larger than 4-0, regardless of whether round, grooved, Figure 9 or Figure 8 shapes, the circular mil area is always used to designate the size. Any reference to so-called 5-0, 6-0, etc., size is erroneous and only adds to confusion, inasmuch as the wire mills do not draw or furnish as standard any sizes other

mended, therefore, in view of the present standard, that reference to sizes larger than 4-0 should always be made in terms of circular mil area; this avoids any confusion as to what is actually in use at the mine and also simplifies the placing of additional orders.

The publication of the foregoing was suggested at a recent meeting of the Committee on Underground Power, to point out the suitability of present trolley wire standards for mining service.



Wheels of Government

As Viewed by A. W. Dickinson of the American Mining Congress

SPURRED on by its hard-driving chairman and by the desire of both Senators and Representatives to adjourn in late November in order to spend a few weeks in their home districts in anticipation of the coming campaign year, the Committee on Ways and Means has reported a revenue bill. The new measure, however, differs widely from the \$10½ billion proposal advanced by the Treasury in that it provides a revenue increase of only some \$2 billion. Senator George, of the Committee on Finance, has spoken approvingly of the Ways and Means Committee's decisions thus indicating the possibility of rapid handling of the measure in the Senate.

Further activities of the Congress during the past month have been in the fields of post-war foreign relations policy, termination of war contracts, post-war reconversion of industry, drafting of fathers for the Army, and reduction of both civilian and military government expenditures. To aid in the latter, the Senate has adopted a resolution permitting the Appropriations Committee to employ skilled personnel empowered to examine the records of any Federal agency.

The Tax Bill

After the close of the hearings on October 20, feelings rose to such a pitch in the Committee on Ways and Means that complete abandonment of any effort to bring out a revenue bill was only averted by a narrow margin. Desire for a retail sales tax which had mounted daily during the hearings, cooled quickly when minority members realized that the responsibility for action on such a tax might be laid at their door in an election year.

The revenue bill as reported does not increase corporation normal and surtax rates but does increase the excess profits tax rate from 90 to 95

percent, retaining the 80 percent limitation on total tax. Increased from \$5,000 to \$10,000 is the exemption from excess profits tax. The credit of 8 percent on the first \$5,000,000 of invested capital remains but the rate from \$5,000,000 to \$10,000,000 is reduced from 7 percent to 6 percent; from \$10,000,000 to \$200,000,000, from 6 percent to 5 percent; and above \$200,000,000, from 5 percent to 4 percent.

Under the income tax on individuals, the normal tax rate is increased from 6 percent to 10 percent and the Victory tax is repealed. The earned income credit is abolished and it is provided that married persons filing separate returns may each take only the exemption allowed to a single person; no tax shall be less than 3 percent of the net income in excess of a personal exemption of \$500 for single or \$700 for married persons plus a credit of \$100 for each dependent. Deductions for any excise, admission or other Federal taxes now paid were eliminated.

Heavy increases were made on a number of excise taxes; local first class postage was increased from 2 cents to 3 cents, airmail from 6 cents to 8 cents per ounce, and parcel post made subject to the 3 percent tax on transportation of property.

Of interest to mineral producers was the action of the committee in placing fluorspar, graphite and vermiculite on the list of strategic and critical minerals exempt from excess profits tax under Section 731. Percentage depletion at the rate of 15 percent was extended to beryl, feldspar, graphite, lepidolite, mica, spodumene, and vermiculite; a depletion rate of 23 percent was extended to potash.

The benefits of the iron ore and coal supplement to the Johnson amendment under Section 735 were extended to lessors and owners of new iron ore and coal mines and timber tracts.

The committee stated that "these new mines and tracts shall be assumed to have increased their production by 50 percent over the base period. This means one-third of the coal production will be considered excess output. Fifty percent of the profits from this excess would be a credit against the excess profits net income."

During the hearings, Henry B. Fernald and Ellsworth C. Alvord, appearing for the U. S. Chamber of Commerce, demonstrated to the committee that under current revenue law net returns to stockholders are so low that venture capital is in danger of drying up. In addressing the committee on fiscal policies, revenue needs and possible sources of revenue, Alvord recommended a retail sales tax at a uniform rate with no exemptions.

Counsel for the Pocahontas Land Corporation, J. M. B. Lewis, Jr., appeared in behalf of amending Section 735 (Johnson amendment) to extend to corporate mineral and timber lessors relief from excess profits tax on income attributable to excess output.

Social Security Increase

In mid-October, Social Security Board Chairman A. J. Altmeyer appeared before the Senate Committee on Finance and recommended that the scheduled 1 percent increase on employers and employees for Federal Old Age and Survivors Insurance benefits be permitted to become effective on January 1, 1944. Altmeyer stated to the committee that the present reserve fund is insufficient from an actuarial standpoint and that employers and employees are in a better position to pay the higher rate today than in past years.

Senator Vandenberg of Michigan, however, explained to committee that while Congress has adopted the principal that the reserve fund should be at least three times the highest estimated annual outgo of the next five years, the present \$4.3 billion fund

is five and one-half times the highest estimate of requirements for the coming five years. Nevertheless, the proposed increase of 1 percent would bring in \$1.4 billion in 1944 and the tax-raising committees may possibly view this source with favor in connection with the problems that the present revenue bill presents.

Joint Price Adjustment Board

Quite evidently in anticipation of any recommendation which the Ways and Means Subcommittee on renegotiation of contracts might make, the War, Navy and Treasury Departments, the Maritime Commission and the RFC have created a Joint Price Adjustment Board, to function in developing procedure for adoption of principles, policies, and interpretations under the contract renegotiation law. It is stated that the Board as one of its duties will interpret and apply the exemption provided for the products of mines, oil and gas wells, and timber. It will also prescribe the form of financial statement which contractors are required to file.

War Contract Termination

There has been a hot battle before Military Affairs Committees of Senate and House, precipitated by the Comptroller General's statement that final settlement of all terminated war contracts should be handled by the General Accounting Office. Representatives of the Government contracting agencies made rebuttal statements to the committees and to the press—for example Undersecretary of War Patterson said "during the past few months uncertainties and doubt as to termination procedure and fears of delay in termination payments have been so widespread as to affect the production of war materials." The U. S. Chamber of Commerce has urged settlement of termination claims in the shortest possible time, warning that review by the Comptroller General will entail harmful delay.

It is quite possible that the Congressional committees may follow the suggestion that the Comptroller General be represented in reaching negotiated settlements but that he should not be given veto authority over the contracting agencies. It is well known that contractors are much disturbed over the interminable delays in reaching settlements which would eventuate if final approval should rest with the General Accounting Office.

Manpower Plan

Following the Baruch report, and the adoption of the West Coast Manpower Program, the War Manpower Commission and the War Production Board have brought forth a basic "urgency" plan which is designed to integrate production needs with manpower resources when and where

needed. The basic feature in the plan is that each local area involved carries the responsibility for the solution of its own problems.

In operation, two local committees are provided for: (1) Area Production Urgency Committee, primarily under the control of the War Production Board, determines which production in the area is of most importance; normally this is done on a plant by plant basis; and (2) an Area Manpower Priorities Committee, primarily under the control of the War Manpower Commission, advises the U. S. Employment Service to allot manpower from the available sources of supply to those plants where it will have the greatest impact on the war effort.

This procedure is now in operation in Akron, Detroit and Hartford; also on the Pacific Coast in San Diego, Los Angeles, San Francisco, Portland and Seattle.

Draft Fathers Law

While the Selective Service System is proceeding in an orderly manner with the military drafting of fathers a bill passed by House, and now in conference between House and Senate, gives the SSS Director, at the present time General Hershey, complete authority over the military draft. Provision is made that men are not to be called for induction because of their occupations. This rather startling change nullifies the McNutt "work-or-fight" order. The bill also provides that single men and childless married men shall be called on a nation-wide rather than a local basis. It also provides a Medical Commission to discuss the lowering of physical standards with a view to further reclassification of men for duty.

Supreme Court on NLRB

In the case of the American Tube Bending Company of New Haven, the Supreme Court has refused review asked by the National Labor Relations Board, thus upholding the right of an employer to express his views to workers concerning union representation, provided there is no coercion and that the employer abides by the results of the employees' votes.

The Second Circuit Court had held that under the constitutional right of free speech the NLRB could not charge unfair labor practices because the company's president, prior to a vote of the employees, had addressed a letter to the workmen and had also spoken to them to the effect that they would ultimately secure better results in bargaining directly with the management than through the agency of a union. The defendant's brief to the Supreme Court stated that there were no records wherein a "reasonable man could find the slightest restraint or coercion" or a violation of the La-

bor Relations Act—further that the company president was protected in what he said to the men under the free speech clause of the Constitution.

Relations with WLB

Those familiar with the procedure followed in handling labor cases before the 12 Regional Boards of the War Labor Board are carefully counseling employers in the various industries to become thoroughly informed as to the methods pursued before and by the boards. Regional Boards refer cases in dispute to a tripartite panel on which are representatives of the employers, labor and the public. The panel conducts the hearings and tries to settle the case, failing in which the case is referred to the Regional Board. The hearings are usually informal but the workmen are practically always represented by skilled negotiators for the union and the employer and his counsel have in the past frequently found themselves poorly prepared.

Any employer who has a case before the Regional Board is urged to get in touch immediately with the employer member of the tripartite panel which is assigned to hear his case. It is wholly ethical and proper that he should do so and also do everything possible to inform his panel member of the full details of the case which is to be heard. Many employers have failed to do this in the belief that the employer member on the tripartite panel is comparable in his position to the judge of a court. This is not so but, to the contrary, the employer member of the panel is appointed for the purpose of aiding the employer, it is his duty to do so, and the employer should be governed accordingly.

Coal Wage Tangle

The Illinois Coal Mine Wage Agreement submitted to the War Labor Board September 23 was the subject of hearings before the Board on October 21 and 22. Representations setting forth objections to the proposed agreement were made to the Board by R. L. Ireland, Jr., speaking for the Appalachian Joint Conference, the Southern Appalachian Joint Wage Conference and the Central Pennsylvania Coal Producers Association. Former Senator Edward R. Burke further presented the position of the Southern Appalachian Operators and D. A. Thomas of the Alabama Operators, while Colonel Crampton Harris and Major Percy Tetlow presented the viewpoint of the UMWA. George C. Campbell, Senator Thurlow G. Esington and D. W. Buchanan presented the position of the Illinois operators.

On October 26 the War Labor Board handed down its decision, stating that while it could approve the basic principle of establishing a

method of payment on an 8½-hour day including travel time, it must also pass on the amount of compensation under the new plan "to determine whether it includes a wage increase beyond the limits of the wage stabilization policy." The Board stated, after assuming an average travel time of 45 minutes, "on this assumption . . . the productive time in the 8½-hour day would amount to 7½ hours. Under the old contract the compensation for this amount of productive time would be 8.125 times the hourly rate (straight time for seven hours and time and one-half for 45 minutes). On the base rate of \$1 an hour this would amount to \$8.12½. The new Illinois Agreement proposes to pay for the eight and one-half hours, including travel time, a base rate of \$8.50. This is a daily wage increase of 37½ cents and is therefore 37½ cents a day more than the the Board is able to approve under the limitations of the Act of Congress and the Executive Orders and Directives issued pursuant thereto.

"The Board could approve a daily wage of \$8.12½ but not more."

The Board explained in detail the basis for its decision and pointed out that it establishes the principle of portal-to-portal pay in the coal industry and "grants such pay to the amount required under the Fair Labor Standards Act, leaving to collective bargaining negotiations after the war the question of whether or not the mine workers should receive additional compensation for travel time beyond the amount required under the Fair Labor Standards Act."

The Board pointed out that the increase in weekly wages provided by the decision would permit miners working a six-day week to average approximately \$60.

As mine worker Chief John Lewis had stated that the miners would not work beyond October 31 without a contract, the men began staying home from the mines in increasing numbers during the last days of October. The miners' International Policy Committee met in Washington on November 1 without taking action on the terms under which the War Labor Board had offered to approve the Illinois Wage Agreement. On the night of November 2 the President again took over the mines for the U. S. Government and authorized Secretary Ickes to negotiate a contract with the mine workers. Ordering the men to return to work Wednesday morning, November 3, the President said "the grievances of the miners have been heard, they have been fairly dealt with. The Government offers the miners a fair contract. They have no right in wartime to refuse to work under it."

Foreign Economic Administration

Of interest to many mineral producers has been the work of the former Board of Economic Warfare. After the Jesse Jones-Wallace battle, Alien Property Custodian Leo T. Crowley was put in charge not only of the Office of Economic Warfare but also of the Office of Foreign Relief and Rehabilitation, the Lend Lease Administration, part of the Office of Foreign Economics Coordination, and the foreign procurement activities of the Commodity Credit Corporation. These are all now blended into the Foreign Economic Administration, which comprises six staff offices, namely those of General Counsel, Economic Program Staff, Organization and Methods, Personnel, Finance, and Management Services—as well as a Bureau of Supplies and a Bureau of Areas.

Under the Bureau of Supplies is the Import Procurement and Development Branch which handles the procurement of supplies in foreign countries, direction of developmental work and import of goods into the United States. Under the several commodity divisions of this branch, foreign mineral purchases will be covered. Included in the Bureau of Supplies also is a Requirements and Supply branch, charged with assembling and presenting foreign requirements, serving as a claimant agency before WPB, programming Lend-Lease exports, and controlling commercial exports. Also included is a Commodities Service Branch carrying under it a Transportation and Storage Division and an Engineering Division. Covering field operations in relation to military plans is the Bureau of Areas which now includes a Liberated Areas Branch, an Enemy Areas Branch, and a General Areas Branch.

Policy on Mineral Production

Made public on October 27 was the long-awaited statement of the War Production Board outlining policy with respect to restricting marginal mineral production as well as additional production of some metals and minerals. The document pointed out that the Board has taken action because of three changed factors in the mineral production program, (1) increased mineral production, (2) revised military requirements, and (3) a greater need for marginal manpower than for marginal minerals.

The Board went on to say that the following action had been taken:

"(1) The Production Executive Committee has decided that after stockpiles of ferro-alloys (vanadium, tungsten, molybdenum, cobalt, etc.) reach recommended levels, domestic production and imports will be kept in balance with the then current consumption. This will insure a supply

of ferro-alloys adequate to meet the needs of the war and avoid excessive accumulations which would be costly both in dollars and manpower. In this connection, arrangements have been made for reducing the government purchases of certain ferro-alloy minerals.

"(2) Premium prices in the B range have been denied to lead mines not already operating, and to lead mines having a low labor productivity and located in areas in which there is serious shortage of labor.

"(3) Premium prices in the B and C ranges have been denied to zinc mines not already operating, and to zinc mines having a low labor productivity and located in areas in which there is serious shortage of labor.

"(4) The Government is not now financing new zinc projects.

"(5) It has been determined that no new Government purchase contracts should be entered into for the import of chemical chromite, vanadium and cobalt.

"(6) Operations in low-grade chrome mines in Montana are to be put in standby condition and labor is to be diverted to mines producing more critically needed minerals.

"(7) Contracts with the larger domestic graphite companies are to be cancelled; the mines of these companies are to be held in a state of readiness for the duration of the war and no more graphite is to be stocked by them.

"(8) Domestic production and imports of mercury for the year 1944 for both private and government purchase are each to be reduced to approximately 70 percent of the 1943 amount.

"(9) The production of bauxite in Arkansas by the three major producers is being sharply cut.

"The further statement was made that administrative action will be taken from time to time on specific cases to meet these objectives and in keeping with the basic minerals and manpower policies established by the Congress and the President, and the directives issued by the Chairman and the Executive Vice Chairman of the War Production Board."

— Off the Press —

1943

COAL MINE MODERNIZATION YEARBOOK

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PERSONALS

P. R. Paulick has resigned his position as general superintendent of the Akron Coal Company, Cambridge, Ohio, and will open an office in Pittsburgh as consulting mechanization engineer. His present address is South Park Road, Library, Pa. Mr. Paulick has had a wide experience as engineer and operator for several large coal companies in the northern Appalachian and Central fields and as a consultant will specialize on mechanical mining.

William Kuchar, Safford, has been appointed Arizona deputy state mine inspector to succeed **J. C. Anglin**, Globe, resigned. The latter has served as a deputy state mine inspector for the past 20 years. He has taken over the operation of his own mine. Mr. Kuchar is a miner and mine operator.

L. C. Whittaker has been promoted to assistant director of the Mining Division, War Production Board, according to an announcement of **A. S. Knoizen**, director of the division. His title is assistant director for staff. **F. Stuart Miller** is also an assistant director of the Mining Division, carrying the title assistant director for operations.

G. H. Cunningham, consulting engineer for American Smelting & Refining Company, has completed his work on the company's new electrolytic zinc plant in Texas and is now at Perth Amboy, N. J., assisting in the development of treatment methods for the company's nickel-ore bodies in Brazil.

Henry C. Carlisle, now acting as advisory engineer for the Metals Reserve Company, lately visited Nevada mining districts in connection with this work from his San Francisco office.

R. V. Tower has been elected vice president of the Cumberland Coal Company, Baltimore, Md. He has had wide experience in coal, administrative, and business engineering capacities.

R. P. Tyler was recently appointed general manager of sales and **C. R. Dean** as assistant manager of sales of **A. Leschen & Sons Rope Co.**, St. Louis, Mo.

J. B. Rensford, superintendent of the Hatfield Campbell Creek Coal Company, has resigned to accept a position as superintendent of the Island Creek Coal Company's river plant at Huntington, W. Va. Mr. Rensford has been associated with the Hatfield interests since 1914 and has an intimate knowledge of river transportation. He will live in Huntington after January 1.

John V. S. Norton assumed duties as industrial specialist, Mining Division, WPB, with headquarters in Washington, late in September. He succeeds **John E. Organ**, who resigned as a technical analyst in the coal section. Mr. Norton is handling matters pertaining to strip mining for the Coal Section, Mining Division.

W. C. Carter, president, Link-Belt Company, Chicago, announces the following promotions: **Edward J. Burnell**, heretofore vice president and general manager in charge of Pershing Road plant operations and central division sales, has been transferred to the Executive Office of the company, 307 N. Michigan Ave., Chicago 1. In his new position Mr. Burnell will be vice president in charge of sales for the entire Link-Belt Co.



Edward J. Burnell

Directly assisting Mr. Burnell will be **Nelson L. Davies**, sales manager for materials handling machinery; **William H. Kinkead**, sales manager for power transmission machinery; and **C. Walter Spalding**, sales manager for power transmission equipment required by original-equipment manufacturers and duplicate machinery accounts. **Harold L. Hoefman**, manager of the company's Atlanta plant, succeeds Mr. Burnell as general man-

ager of the Link-Belt Pershing Road plant in Chicago. **Richard B. Holmes**, district manager at Indianapolis, has been appointed manager of the Atlanta plant to succeed Mr. Hoefman. **David E. Davidson**, district engineer, Detroit, has been named district manager at Indianapolis to succeed Mr. Holmes.

Kenneth Richards has recently been promoted from assistant geologist to chief geologist for the Consolidated Coppermines at Kimberley, Nev. He succeeds **E. N. Pennebaker** who is now consulting geologist for the company.

J. E. M. Wilson, district manager for the Jeffrey Manufacturing Company in Pittsburgh, Pa., has been loaned by his company to serve as technical advisor to the Mining Machinery Section, Mining Division, War Production Board.

Jerome C. White, of Ebensburg, Pa., well-known coal-mining official, left September 28, 1943, for Camp Custer, Mich., where he will enter active service of the Army with a commission of captain. During the first World War he was a member of the Navy. For the past several years Captain White has served as personnel manager for several large mines, including the Monroe Coal Mining Company, Revloc, Pa.; Heisley Coal Company, Nanty Glo, Pa.; Red Lands Coal Company, Heilwood, Pa.; and the Dawson Coal Company, Clarksburg, W. Va.

L. N. Wenerstrom, a mining engineer formerly at Allenby, B. C., is now metallurgist for Tamarack & Custer Consolidated Mining Company, at Wallace, Idaho.

A. G. Richardson, formerly superintendent of preparation, Elkhorn Coal Corporation, and section foreman, Inland Steel Company, Wheelwright, Ky., has accepted a position as safety and coal preparation engineer for Dickinson Fuel Company, Charleston, W. Va.

A. John Eveland has changed his headquarters from Reno, Nev., to 1810 Russ Building, San Francisco 4, Calif. Mr. Eveland is a mining geologist and engineer.

The Board of Directors of the Youghiogheny and Ohio Coal Company recently announced the election of **William M. Osborne** as president to succeed the late **Walter M. Robison**. Other officers selected were **James M. Osborne**, vice president; **C. H. Osborne**, vice president; **James Patterson**, vice president in charge of operations; **C. P. Wright**, vice president; **F. H. Hole**, vice president, and **W. E. Frey**, secretary-treasurer.

Harry C. Chellson, Editor of *MINING CONGRESS JOURNAL*, left on November 1 to become Manager of Research in the Business Department for the McGraw Hill mining publications, *Engineering & Mining Journal* and *Coal Age*. Mr. Chellson is a graduate of the New Mexico School of Mines (1923) and his practical experience in



the mining industry was gained in several Western states, Mexico, Central Asia and Siberia.

Mr. Chellson was associate editor of *Engineering & Mining Journal* for six years and editor of *MINING CONGRESS JOURNAL* during the last two years.

David L. Francis, Vice President and General Manager, Princess Elkhorn Coal Company, Huntington, W. Va., is stationed at the Naval Air Material Center, Philadelphia, engaged in management engineering work in connection with the manufacture, overhauling and repairing as well as experimental work with naval airplanes.

R. H. Rodolf has been appointed manager of the pump and compressor division of Gardner-Denver Company, Quincy, Ill., following the death of R. J. MacFarland. Mr. Rodolf's connection with the company dates back to August, 1917. Appointed as Mr. Rodolf's assistant is C. M. George, who joined the Gardner-Denver organization in Quincy in January, 1929.

Howard J. Thomas has resigned as general superintendent of the Consolidated Coal Company, which owns Bankhead Nos. 1 and 2 mines, Walker County, Ala. The company also is operating agent of Summit mine, coal division, Southern Cotton Oil Company.

A. A. Jenkins has been appointed general sales manager of the Ohio Division of the M. A. Hanna Company. He will assume the duties formerly discharged by the late P. C. Sprague.

Walter H. Bachman, sales engineer for the C. S. Card Iron Works Co., Denver, Colo., has been elected president of the company.

D. C. Kennedy, executive secretary of the Kanawha Coal Operators' Association, one of Mr. Newton's Advisory Committee, has resigned from that committee following the termination of Government control of mines and will again assume his regular duties with the association when his official affairs are completed in Washington.

Arthur B. Stewart, president of the Davis Coal & Coke Company, has been appointed to membership on the new bituminous coal producers advisory board for District No. 1, which includes mines in eastern Pennsylvania.

C. D. Brown, chief engineer of the Locust Summit Division, Philadelphia & Reading Coal & Iron Company, has been promoted to chief mining engineer, according to **George Roos**, general manager of the company. Mr. Brown succeeds **William C. Muchloff**, now chief engineer under Mr. Roos.

H. A. Dierks has resigned his position as mining engineer for Pierce Management, Scranton. Mr. Dierks will accept a new position in the mining department of the Glen Alden Coal Company, Scranton and Wilkes Barre.

Officers of the Timken Roller Bearing Company recently announced the appointment of **Whitley B. Moore** as director of sales for all divisions of the company, including industrial, automotive, railroad, service-sales, steel and tube, and rock bit. He is to be succeeded in his present position of general manager of sales of the Timken Steel and Tube Division by **C. H. McCollam**.

F. E. Bedale, with the Department of Safety, Consolidation Coal Company, Fairmont, W. Va., recently resigned his position with the company so as to find a more suitable climate for Mrs. Bedale, who has been ill for some time.

— Obituaries —

Carl H. Cole, formerly superintendent of the Phelps Dodge Corporation smelter at Douglas, Ariz., died in early September in El Paso, Tex., following a major operation. He was 54 years old. He was first employed by the Calumet and Arizona Mining Company, as a junior engineer, in 1912; and in 1917 was advanced to chief metallurgist. He continued in the position when the company merged with the Phelps Dodge Corporation; and in 1938 he was appointed superintendent of the Douglas smelter. Cole took leave of his position in August, and was succeeded by **Morris G. Fowler**, at the time general superintendent of the United Verde branch of Phelps Dodge at Jerome and Clarkdale, Ariz. Fowler joined the United Verde Copper Company in 1922.

Frank J. Kohlhaas, director and vice president of the Calumet and Arizona Mining Company, died recently in Calumet, Mich. He was also a director of the Phelps Dodge Corporation. For many years he was a member of the board of control of the Michigan College of Mining and Technology. He was also president of the Merchants and Miners Bank of Calumet.

Albert Burch, at one time manager of the Bunker Hill and Sullivan properties at Kellogg, Idaho, member of the governing board of the Oregon department of geology and mineral industries, died last month at Medford, Oreg., aged 76. Mr. Burch retired some years ago from the mine consulting firm of Burch, Caetani and Hershey of San Francisco.

M. P. "Mike" O'Toole, district sales manager for the Ohio Brass Company in the anthracite field, died on September 27 in Philadelphia. He had been in ill health for the past year and only recently returned to his ter-



ritory. He suffered a heart attack on September 26 from which he did not recover. Born in 1896, Mike had been associated with Ohio Brass since 1922 and had been a member of the sales organization since 1927. He is survived by his mother.

Neil A. McGill, 59, mining engineer, widely known in mining communities in the Southwest, and resident of Phoenix, Ariz., died in late September in Albuquerque, N. Mex. At time of his death he was serving the U. S. Army Southwest Division Engineers in New Mexico in work dealing with the appraisal of mining claims for the War Department. He was a graduate of the Yale University Sheffield Scientific School, and came to Arizona in 1912 from Ely, Nev. He was born in McGill, Nev.

News and Views

Eastern



States

WEST VIRGINIA

» » » The West Virginia coal industry received a jolt by the grant of authority issued to the Tennessee Gas & Transmission Company to construct a pipe line for the transmission of gas from Texas to a terminal in West Virginia about 20 miles north of Charleston. This is really carrying coals to Newcastle, or to be more accurate, "gas to Gasland," since the terminus is a regular nest of refineries with an adequate supply of natural gas literally in their respective back yards.

News commentators and editors point to political connections in the certificate issue, as the Tennessee company had as president, Colonel Curtis B. Dall, former son-in-law of President Roosevelt, and upon receiving the grant, Colonel Dall sold the greater part of his stock to the Marshall Field estate whose principal legatee is reported to be a favorite of the New Deal.

The jolt in the transaction for the coal industry here comes by reason of a loss of three or more million tons which will be displaced by the intrusion. In the face of the intense and concentrated drive which is continually in progress for scrap supplies for the steel mills, it is beyond understanding of many in the district why the certificate was issued.

» » » The Bluestone dam project is back in the news again. In 1911 the West Virginia Power Company, a subsidiary of Appalachian Electric Power acquired, after surveys, considerable acreage on New River above Hinton for the location of a power dam, one

of two possible sites being Bull Falls. Several injunctions followed the application of the power company for permission to build the dam and in 1941 the Government undertook the construction of a 150-foot structure as a part of its flood control program for the Ohio River, New River being a contributing flowage. The decision of a commission appointed by the late Judge G. W. McClintic places a valuation of \$1,013,512.44, or approximately \$400,000 under the power company valuation. The Government work was halted because of war needs for critical materials and it would seem there is nothing to interrupt the construction except the war demand for the material essential to completion, although power may be developed as a later advisable by-product of the flood control project.

» » » A \$27,000 synthetic rubber fabricating plant will be opened soon at South Parkersburg, W. Va., by Dr. Glenn L. Casto, for the manufacture of crude synthetic rubber into flat sheets for commercial purposes. This follows an announcement about a year ago that Dr. Casto was prepared—or nearly so—to manufacture a synthetic rubber tire made from coal, a test of which was being made on taxicabs in Washington. There was some Congressional investigation of the proposal, but it is now apparent the taxi test was not successful although the synthetic rubber still retains commercial value.

» » » The annual meeting of the Kanawha Coal Operators' Association, on October 20, was confined to members only. Because of transportation difficulties the usual annual outing, with its golf and other recreation features, was not held, but a "rain check" for subsequent parties was issued to their usual guests. Carl E. Newton, president of the C. & O. Railway, was the principal speaker at the dinner which followed the business meeting.



Tipple and cleaning plant of the Gulf Smokeless Coal Co., near Tams, W. Va.

» » » L. N. Thomas, of Charleston, was reelected president of the Kanawha Coal Operators Association. Others named included A. S. Wilson of Sharples and W. M. Miller of Reed, vice presidents; D. C. Kennedy, Charleston, executive secretary; H. G. Kennedy, Charleston, general secretary and John L. Dickinson, treasurer.

Board members elected were: F. L. Hornickel of Cleveland, C. W. Connor of Montcoal, F. O. Harris of Cannelton, A. O. Hogue of Mahan, D. W. Martin of Charleston, W. F. Pioch of Huntington, O. B. Pryor of Elm Grove and Garner Williams of Kayford. Directors emeritus named were A. W. Pollock of Ramage and C. A. Cabell of Charleston.

The principal talk at the banquet was made by Walter J. Touhy, vice president of the Chesapeake and Ohio Railway and assistant to Deputy Coal Administrator Carl E. Newton.

» » » A specially designed extension class on maintenance of mining machinery has been inaugurated at the University of West Virginia, Morgantown. It will teach fundamentals of electricity and mechanics, maintenance practice and mining machinery control circuits over a period of 30 classes, each two hours long, held twice a week.

PENNSYLVANIA

» » » A decision was rendered, October 4, by the Pennsylvania Supreme Court concerning the suit of the City of Philadelphia against certain anthracite coal mining companies for polluting the Schuylkill River with coal silt. It suggested that the city start proceedings in the Philadelphia Court of Common Pleas, and bring in as defendants, bootleg breaker operators in addition to the mining companies already named.

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» » » Plans for post-war retention of the currently enlarged anthracite demand were disclosed recently in Philadelphia. The Automatic Coal Burner Company, Inc., will direct definite plans to modernize anthracite coal burning equipment in the Atlantic Seaboard states through the use of temperature controls, and a special manual service developed to relieve the consumer of the duties of firing the furnace and taking out the ashes. The president of the corporation is Charles A. Connell, Philadelphia. Robert V. White, president of the Lehigh Coal & Navigation Company is chairman of the board, which will include: G. B. Fillmore, vice president, Hudson Coal Company; H. J. Connolly, president, Pennsylvania Coal Company; and C. W. Stone, general sales agent of M. A. Hanna Coal Company. Tests of the manual firing and ash removal service will be made first in Lansdowne, near Philadelphia, where the results can be watched closely.

» » » The Evans Colliery, Hazleton, resumed operations recently after being idle for a year. About 175 men formerly employed at the mine are expected to resume work.

» » » R. L. Dougherty, general manager of the Knox Coal Company has announced that the Exeter shaft, closed for the past 10 years, will be reopened. Present plans calls for the employment of 375 men, and a daily production of 2,000 tons.

» » » For the purpose of becoming more familiar with strip mining in the anthracite area, a legislative subcommittee of four Senators and nine Representatives toured the region during October. Based upon the investigation then made, definite proposals are expected to be delivered to the 1944 General Assembly.

» » » An accumulation of water in shafts 4 and 5 of the Lehigh Navigation Coal Company, Lansford, is now being removed by pumps with a capacity of 8,000 gallons per minute. These shafts were allowed to fill with water several years ago to extinguish a mine fire. Their rehabilitation will help to maintain the present creditable production record of the company.

» » » The Philadelphia & Reading Coal & Iron Company, Pottsville, showed a net profit of \$73,312

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Representatives in Principal Mining Areas

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9th Annual Coal Conference

Pittsburgh, December 3, 1943

All coal operators and manufacturers of mining equipment are invited to attend the Ninth Annual Conference of the Coal Division of the American Mining Congress, to be held at the William Penn Hotel, Pittsburgh, Friday, December 3, 1943. This is a general meeting of the Coal Division committees, to correlate the various studies which are being made for the service of the coal mining industry.

Each committee will present its report, reviewing the studies that have been completed and outlining plans for future activities. All this will be presented for open discussion and suggestions from those present. Among the subjects which will be presented are "Preventive Maintenance for Loading Equipment," "Instructional Training for Machine Operators and Repairmen," "Methods of Loading Belt Conveyors," "Care and Maintenance of Underground Belts," "Dust Abatement at the Working Face," "Fundamentals for a Mine Ventilation System," "Mine Roof Sealing," "Recovery of Fuel Values from Mine Refuse," "Safety," "Color Standards for Electric Cables," "Splicing and Vulcanizing Electric Cables with Synthetic Insulation," and "Revision of Track Turnout Standards."

This will be a one-day conference, with sessions in the morning and afternoon, to be followed by the annual dinner Friday night, where a guest speaker of national prominence will talk on a subject of special interest to the mining industry.

during 1942 against a net loss of \$349,615 during 1941. Present developments indicate that this company may come out of 77B (bankruptcy law) during the near future. Final hearings regarding that contingency will be heard by Judge Kirkpatrick of the United States Federal Court.

» » » The Delaware Construction Co., Minersville, a new anthracite coal mining company has been incorporated. The incorporators are: Frank Cannova, Shenandoah; S. N. Farley, Pottsville; and Louis Spaniard, Frackville.

» » » Permission has been asked of the United States District Court by the Philadelphia & Reading Coal & Iron Company, Pottsville, to buy the coal property and breaker of the Westwood Colliery, Inc., Tremont. The acquisition of the foregoing property by the Reading will improve its sales position, now pressed with an unprecedented demand for coal.

» » » Reports from the Lehigh Navigation Coal Company, Lansford, show the greatest production in its 120 years of business.

NEW YORK

» » » Additional protection has been provided for employees of the MacIntyre Development, Titanium Division of the National Lead Company, at Tahawus, N. Y., with the extension of its group program to include accident and health coverage in addition to the life insurance and annuity plan already in force. Announcement of

the new schedule was made by Otto Herres, resident manager of the development. The plan is being underwritten by the Metropolitan Life Insurance Company on a cooperative basis whereby the employees contribute fixed amounts and the employer bears the balance of the entire net cost. Under the new schedule, employees will receive from \$10 to \$40 a week for sickness or non-occupational injuries. The life insurance plan provides insurance ranging upward from \$1,000 to more than \$5,000. An additional feature of the program is the distribution of pamphlets on health conservation and disease prevention.

GEORGIA

» » » The war has stimulated production of metals and non-metals in Georgia. State Geologist Garland Peyton recently reported that 10 years ago mineral production had a value of \$7,500,000, whereas in 1943 the value is expected to be over \$2,000,000. Iron mining has been revived and it is expected the value of ore produced will exceed \$20,000,000 against \$564 in 1933 and \$722,013 in 1942. Other minerals produced in the state are mica and bauxite.

KENTUCKY

» » » The annual meeting of the Big Sandy-Elkhorn Coal Operators' Association, postponed from June 4, was held in the offices of the association, Ashland, Ky., Friday, October 8. The meeting was well attended by members representing over 95 percent of association tonnage, and a

wide variety of subjects affecting the coal industry and war effort were discussed. The following board of directors was elected for the ensuing year: J. E. Bowman, vice president, Utilities Elkhorn Coal Co.; L. C. Campbell, vice president, Koppers Coal Division; H. K. English, vice president, Clear Branch Mining Co.; Harry B. Crane, general superintendent, Elk Horn Coal Corporation; W. L. Doolittle, vice president of operations, Consolidation Coal Company; M. H. Forester, vice president, Western Division, Consolidation Coal Co.; J. R. Hurt, secretary, Sandy Valley Coal Co.; Harry LaViers, president, Princess Elkhorn Coal Co.; A. H. Mandt, vice president, Stephens Elkhorn Fuel Corp.; K. S. McKinney, superintendent, James Hatcher Land Co.; E. R. Price, general superintendent, Inland Steel Company; W. F. Pioch, manager, North-East Coal Co.; C. D. Reed, president, Turner Elkhorn Mining Companies; B. F. Reed, secretary-treasurer, Turner Elkhorn Mining Companies; Alan J. Smith, president, South-East Coal Company; W. W. Goldsmith, receiver, Elk Horn Coal Corp.

A meeting of the board of directors was held immediately after the meeting, and the following officers were elected: Harry LaViers, president; B. F. Reed, vice president; H. S. Homan, secretary; M. H. Forester, treasurer.

NEW HAMPSHIRE

» » » The De Mott mica mine, 4 miles southwest of Grafton, Grafton County, N. H., has recently been studied and mapped by geologists of the Geological Survey, United States Department of the Interior. The work was part of the study of domestic deposits of mica that the Geological Survey is making in an effort to increase the production of this mineral, which is needed so vitally in some of the war industries. The property is owned by Charles W. De Mott, of Grafton, N. H., and is leased by Elmond Gillette of New York City. Mica occurs in a pegmatite dike, which trends approximately north-south and crops out intermittently for a distance of 800 ft. Its width of outcrop ranges from 10 to 380 ft. Lack of exposures prevents accurate determination of the structure of the dike, but where observed the walls are exceedingly irregular in direction and dip. Development includes about 10 small open cuts.

Rum-colored muscovite occurs disseminated throughout the pegmatite in minor amounts. Small local concentrations occur in the southwestern corner of the southernmost pit and with small quartz masses in the northern part of the pegmatite. Some beryl and a little lollingite were noted.

Central



States

MISSOURI

» » » Strip mining of lead and zinc ore deposits is somewhat of an innovation in the production of these metals, but experience shows it is being profitably followed in the Tri-State zinc mining field near Webb City, Mo.

To further exploit a shallow underground mine at the Oronogo property, remove pillars and remove areas of lower grade ore, the mine maps were carefully studied and a plan worked out for open pit mining, and a series of benches were started from the surface with regular stripping equipment. Eventually an open pit zinc-lead mine developed and in present-day cleanup work on the benches and in remote areas in the pit, Hough shovels mounted on T-6 International tractors are being used. They also load ore onto trucks and occasionally help boost heavily-loaded trucks up steep grades in the pits. The vertical hoisting and lowering action of this shovel with its direct forward delivery is said to be suited for bench work of this type. The machine is mounted on rubber tires and has the maneuverability of a light automobile. It can serve both as a shovel and pusher, and assembles and loads loose material faster than a gang of workmen with shovels.

A Hough loader featuring a bulldozer type of shovel or scoop with hydraulic lifts and 1-ton capacity is also used to load the ore at the mill bin into trucks at the Central mill of the Eagle-Picher Mining and Smelting Company. So far satisfactory loading results have been obtained, with spillage not more than 200 lb. to the car. John W. Ground, of Joplin, supervises the company's ore loading operations.

MICHIGAN

» » » The U. S. Bureau of Mines has opened an office in Ironwood, Mich., to look after the activities of the Bureau in Wisconsin and northern Michigan. At the present time the Bureau is engaged in sampling some of the iron bearing rock on the Gogebic and Marquette ranges which might be beneficiated. This work is being carried on as part of the Bureau's program of assistance to the iron mining industry.

» » » The Federal Bureau is also doing some preliminary prospecting for tungsten in Marquette County. The dumps around the old test pits and shafts at the old Grummet gold exploration northwest of Ishpeming showed indications of tungsten and at the present time these old openings are being pumped out and sampled. The Bureau of Mines activities in Wisconsin and northern Michigan are

under the supervision of E. P. Barrett whose headquarters are in Minneapolis. Owen Terry represents the Bureau in the field and Clyde L. Holmberg is the engineer at the Ironwood office.

» » » The dredge which was built to reclaim the tailings from the old Quincy Copper Company operations was started during the middle of September. The rich tailings which were discarded during the early days are in the center of the pile and it is necessary for the dredge to dig itself into the rich area before pumping feed to the regrind mill which has been built during the past year to recover this copper.



The Oronogo open pit mine showing some of the old underground workings



The portable shovel quickly cleans up the benches in the open pit mine and helps to load the ore trucks

KANSAS

» » » The Ebenstein mine, near Baxter Springs, Kans., operated by the Bilwill Mining Company, was recently brought back into production after being shut down for several months. During the suspension of operations ore bins were constructed at the No. 1 shaft and on the Leopard lease. The latter unit will facilitate the movement of ores to the Eagle-Picher Central mill near Cardin, where the ore will be concentrated. J. L. Scott, of Baxter Springs, is superintendent and William Grundler is foreman.

ILLINOIS

» » » The fifty-first annual meeting of the Illinois Mining Institute was held at the Hotel Abraham Lincoln, Springfield, Ill., on November 12, 1943.

Among the papers presented at the meeting were "The Activities of the Health and Safety Service of the U. S. Bureau of Mines in Connection With the War," Dan Harrington, chief, Health & Safety Service, U. S. Bureau of Mines, Washington, D. C. "Proven Results of New Methods, and Their Stability," D. W. Jones, superintendent, Princeton Mining Co., Princeton, Ind., and E. H. Johnson, manager, Loading Machine Division, The Jeffrey Mfg. Co., Columbus, Ohio. "Use of Large Shovels in Illinois Strip Mines," L. H. Sherwood, superintendent, Little John Coal Co., Victoria, Ill. "Comments on the Formation of Committee to Conserve Manpower in the Coal Mining Industry by Preventing Accidents," Thomas Moses, chairman, National Committee for the Conservation of Manpower in Coal Mining, Pittsburgh, Pa.

At the dinner T. J. Thomas, associate deputy, Solid Fuels Coordinator for NLB, was toastmaster and L. W. Baldwin, chief executive officer, Missouri Pacific Lines, St. Louis, Mo., was guest speaker.

» » » At the group meeting of The American Society for Metals held in Chicago, October 20, 1943, under the general subject of "Post-war Planning in Non-Ferrous Metals," Ernest V. Gent, Secretary, American Zinc Institute, Inc., New York, discussed the position of zinc.

He said in part:

"One of the most difficult problems likely to be met in the postwar period is the accumulated stocks of strategic minerals and metals in the hands of government departments and agencies, including the Army and Navy. The Zinc Institute, on behalf of the zinc industry, has endorsed the policy of Government stockpiling and urges that zinc stocks at the end of the war

should not be liquidated, but conserved as part of our natural resources against future emergencies. Stockpiling of these excess stocks will not only provide for future defense needs, but also will enable mines, smelters and refineries to continue employment which otherwise might be impossible.

"Galvanizing has always been the largest outlet for zinc in peacetime. In an average year, from 40 to 50 percent of all slab zinc production is used for zinc coatings. The reason for this is well known. Long ago,

the Bureau of Standards termed zinc '... by far the best for general rust-proofing. . . .' Zinc not only gives mechanical but also electrochemical protection.

"In recent years a great deal of attention has been given to the improvement of zinc coatings. Galvanizing machinery design has been revolutionized, together with much finer mechanical and metallurgical control. Patented processes have been developed which have led to new types of galvanized sheets, strip and wire. Added uses have been developed for



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galvanized products and the war has accelerated, rather than curtailed, this tendency. It is believed that thousands of mechanics who have learned to work with zinc-coated materials in war plants will retain this knowledge and skill, and later apply it to more and more civilian goods.

"In 1938, the latest normal year, zinc in brass represented about 25 percent of total zinc consumption. Considering the starvation of civilian uses during the war period and the reconstruction era expected to follow, it seems reasonable to anticipate at least as large a tonnage from this particular market as in earlier peacetimes.

"Imagine the possibilities for brass in the new construction and in all the remodeling which is contemplated. Then there is the anticipated demand for such things as radios and refrigerators, for example, which in all post-war studies is rated in very high figures.

"Zinc alloy die castings, which in a little more than 10 years developed from a very minor outlet to a market for 125,000 tons or more of special high grade zinc, have firmly established themselves. The main applications of die castings in the pre-war period were in automobiles, followed by household appliances such as washing machines, refrigerators and kitchen appliances, and in tools and hardware. The use of zinc alloy die castings in the years immediately following the end of the war should bear a very definite relation to the quantities of these products which the public is able to purchase.

"It is reasonable to assume that the postwar position of rolled zinc will be somewhat similar to its pre-war position. The larger outlets for rolled zinc, such as dry battery cups, fruit jar caps, lithographer's sheets, photoengraver's plates, address plates, eyelets, and hull and boiler plates, are based upon certain characteristics of the metal, and rolled zinc will probably be used for these items in normal tonnages."

F. E. Wormser, secretary of the Lead Industries Association reported some interesting observations about the position of lead in the post-war era.

"No one can now make, with any clarity, an appraisal of the situation in lead after the war is over. Certain observations, however, seem quite safe.

"It is quite possible that production from lead mines in the United States after the war will be lower than it was before World War II, but a lot will depend on the price of lead which then prevails. Lead production has been greatly influenced by the price which is paid for the metal

and I think that situation will continue to exist.

"When we turn to the other side of the picture and examine the future outlet for lead the industry can take great comfort in the widespread utility of the metal. Lead has an amazing diversity of uses.

"My own feeling is that the future of lead compounds is especially bright and I look to see other applications made of the lead compounds known today, or others in the laboratory stage or to be discovered, which will help our industrial and civilian economy.

"Before I close, perhaps a word on

the stockpile situation may be worthwhile. The government now possesses a large accumulation of pig lead. At the rate metal shortages are being made up other metals, I believe, will also have government stockpiles before many months are past. Newspaper reports have indicated that Congress is giving the subject considerable attention and I hope the entire metal industry may anticipate constructive legislation that will prevent these stocks becoming demoralizing market influences so that the transition from war to peace, difficult as it is, will not become so very much more difficult."

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and they will do a better job of bringing down coal. They can seal their shots easier, quicker and better—getting the ultimate in shot-control with a greater degree of safety. Mines now using SEALTITE TAMPING BAGS have decreased tamping time and powder costs by increasing tonnage with more effective shooting.

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California Chapter, American Mining Congress Meets in San Francisco

AT THE September meeting of the Board of Governors of the California Chapter of the American Mining Congress, San Francisco, vital problems of the mining industry were discussed and resolutions adopted.

To bring about more efficient production of non-ferrous strategic metals, better cooperation on the part of the U. S. Employment Service with strategic metal mine operators was requested, in the following respects:

1. More care should be taken by the United States Employment Service in certifying persons for employment in mines by first determining their fitness for such employment, and giving due consideration to the safety factors and hazards involved in underground mining. The certification of physically and mentally unfit persons results in an undue hazard to them and to all other employees if they are accepted, and in useless and needless expense to the mine operators if they are rejected.

2. United States Employment Service should give more consideration to the recommendation of mine operators and their personnel representatives and not refuse certification to suitable persons engaged by such operators for representatives for work in strategic metal mines.

3. The discrimination which has been shown in some United States Employment Service offices against the right of metal mine operators to recruit necessary labor in the vicinity of said offices is a great detriment to the maintenance of a necessary and efficient labor supply in said mine and should be discontinued. There is no reason why, within the limits of approved wage scales, mine operators should not be permitted to engage available labor, bring the persons engaged to the nearest employment office and have them certified for employment so long as no attempt is made to pirate labor from other strategic industries in so doing.

4. More prompt action should be had in the United States Employment Service offices on applications for certification. Delays and apparent discrimination in certifying men for employment in non-unionized metal mines should be discontinued. The right of employees to organize in a given property is not a matter within

the United States Employment Service jurisdiction, and should be left strictly to the men themselves and those charged with the administration of the National Labor Relations Act.

Seeking to speed up the approval of wage contracts, the following resolution was adopted:

Resolved, That the non-ferrous metals division of the War Labor Board be urged to accelerate the processing of applications for approval of wage contracts in strategic metal mines. The past practice of allowing at least 90 days to elapse before action on such applications, where an employer and employees are agreed on the terms of the contract, is highly detrimental to industrial morale, and has frequently been a cause for charges by the employees that the employer is stalling the effective date of the contract, whereas, in fact, the employer is helpless to do anything about it before the War Labor Board approves the agreement.

Resolved Further, That the tendency of the War Labor Board to insist on uniform mine wage scales over large areas should be discontinued, due to the fact that operating and living conditions are very different: in,

- (a) mines situated a considerable distance from towns necessitating boarding house and company living quarters;

- (b) due to different working and living conditions in the high altitude mines; and

- (c) due to more advantageous living conditions at mines situated in and near populated communities.

The gold mine scale should continue to be eliminated entirely from the scope of War Labor Board orders.

Drafting of hoist engineers into the armed services seriously threatens the deep gold mines, operating on a maintenance schedule only. The following resolution urging deferment of these men was adopted:

Resolved, That mine hoisting engineers employed in deep gold mines operating on a maintenance basis should be granted deferment from selective draft and any pressure to change employment to strategic industries. Only by keeping these trained men in their present employment will it be possible for the deep gold mines to keep unwatered and

retimbered, and in condition to resume operation. Safety factors absolutely preclude the employment of over-age or physically handicapped men in the position of hoisting engineer. The number so employed is very small and the preservation of these gold mines and the communities in which they operate justifies the deferment of these key employees from being forced into military service or war industries, even under present manpower conditions.

A resolution was also passed urging simplification of procedure for the mining industry in obtaining materials and supplies to which the various General Preference or "M" Orders and Limitation or "L" Orders apply. This follows the stand taken by the Mining Congress Coal Division in Cincinnati in July.

A plea was also made to the War Manpower Commission to consider a proposal to permit each gold mine now being operated on a purely maintenance basis, and without the right to produce any ore, to mine and extract sufficient ore to pay the actual cost of keeping the mines pumped out and retimbered. The manpower used for this purpose would not be suitable or available for either military service or strictly war industries. Failure to grant such a modification will result in forcing those mining companies now on a maintenance basis either to deplete their treasuries to the vanishing point or to close down and wholly lose their mines due to the economic impossibility of ever unwatering and reopening caved workings if maintenance should stop for any substantial period of time.

The need for financial help for shutdown gold mines, to make it possible to preserve the properties for post-war operation, was discussed and the following resolution adopted:

Resolved, That the Reconstruction Finance Corporation should be requested to grant loans to gold-mining companies having ore reserves of a value sufficient to constitute security therefor, by means of which such companies may be enabled to finance the continued maintenance of their properties in an unwatered and timbered condition, until such time as they may lawfully resume production. The granting of such loans will not only be an act of justice to these mine operators who have been prevented by Federal mandate from continuing their operations, but it will also preserve the principal if not the sole industrial support for the numerous communities in which these mines operate and will furnish a source for substantial reemployment after the war.

Taking up the tax situation, action was urged to the following ends:

1. To secure clarifying rulings from the Treasury Department with respect to deductions for depreciation,

permitting gold mines to extend the period for writing off accruing depreciation by a length of time equal to the period during which their mines are closed by Federal order, and to carry forward for such period losses resulting from such unamortized depreciation.

2. To urge Congress to so amend the Revenue Act as to compel the Treasury to compute percentage depletion on the true gross income from the property and to forbid the deduction from gross income received from metals mined and produced of any charges for mining, crushing, concentrating, cyaniding, furnacing or smelting the ores in obtaining the basis for computing percentage depletion, and to forbid the arbitrary allocation of profits between these various operations.

3. To urge Congress to amend the Revenue Act so as to compel the Treasury Department to recognize the intent of Congress to exempt from the excess profits tax the gross income of strategic metal mines without deducting therefrom cost of beneficiation of ores.

Action was also taken endorsing the Scrugham bill, with amendments as proposed by the San Francisco Chamber of Commerce. A resolution

was also passed approving and endorsing the enactment of H. R. 835 by Congressman John M. Costello, amending the Fair Labor Standards Act of 1938 by limiting the award of back pay and the approval of claims under the Act to a period of one year prior to the filing of the complaint with the Wage and Hour Administrator, or the court, whichever is earlier.

NEVADA

» » » Rich cinnabar ore has been developed in the Bottle Creek quicksilver district in central Humboldt county at the east base of the Jackson range, says reports from E. George Howe, president of the company, who was recently in Reno. The ore has been developed by through shafts, open cuts and by crosscut tunnel work by the Molybdenum Products Company. Mercury production in the Bottle Creek district during the past three years has been substantial from furnaces and retorts operated on several properties, the ore being derived from surface deposits which contain sections and spots of high grade cinnabar. Development of furnace-grade

ore, with labor shortage and other wartime obstacles, is said, however, to have left little profit for most of the operators. Molybdenum Products has now arranged for a big treatment plant and has prepared for early installation on the Blue Bucket mine which it owns or controls. Samples are said to have contained as high as 120 pounds of mercury per ton from ore developed by crews of the U. S. Bureau of Mines.

» » » Getchell Mine, Inc., has shipped its eighth carload of arsenic to the American Smelting & Refining Company at Garfield, Utah. The arsenic is a by-product of the Getchell gold-bearing ore. Getchell is also operating a tungsten mill, working ores on its own land, and also custom ores, and is enabled to continue its gold mining in conjunction, as its mill handles all ores at one time.

» » » Steady production of quicksilver continues at the Pershing Mine, located in the Antelope Springs district, about 20 miles east of Lovelock, Nev. This district produced heavily for a short time during the late 20's when the quicksilver price exceeded \$120 per flask. At that time the Pershing plant was erected, employing a Herreschoff and a rotary furnace for the recovery of mercury. At the end of 1941 the property was reopened and operations have been maintained at the plant where the Herreschoff furnace has been in operation. L. R. Messer is general superintendent. The property is considered a medium sized producer. About 25 men are employed.

» » » Wage increases have been granted by the War Labor Board to some mining companies in Nevada. Getchell Mines, Inc., and Cordero Mining Company in Humboldt County were granted 13 cents and 7 cents per hour increase, respectively. Other increases granted in the state were the Ely Valley Mine at Pioche from 20 to 70 cents per day; the Pershing Quicksilver Company at Lovelock from two to seven cents an hour. Wages for miners were formerly 80 cents and muckers 75 cents per hour at this property. The Cherry Creek Mining Company at Cherry Creek was granted a 45 cents per day increase and the Desert Silver Hall molybdenum project at Tonopah was also granted an increase.

» » » Pioche gives promise of becoming one of the nation's foremost centers for zinc, lead and manganese production, say reports from that district. The recent announcement



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that a large eastern organization, not definitely identified to date, had acquired a 90 percent interest of the Combined Metals Reduction Company, formerly owned by the National Lead Company, has lent much significance to the claim of the future prosperity of Pioche.

» » » James O. Greenan, mining engineer and operator of Reno, in a conservative statement made public this week, says that 70 tons of ore have been shipped daily from the Majuba Hill copper-tin mine in Pershing county. He says that ore bodies of major importance have been opened and that copper ore is being broken over a width of 30 feet and that cross-cuts indicate more than double that width of similar ore. "We are shipping at the rate of one 70-ton carload daily," Greenan said. "The ore is, in general, low grade silicious copper ore, although there are, of course, patches of higher grade. The ore occurs as a replacement of a rhyolite plug, which has been intruded into sedimentary rocks which are, in general, shaly limestones. It contains some silver and a little gold and is highly desirable as a flux in the Utah smelters." Greenan said that settlements and assays have not yet been received on a recent shipment of tin concentrate, which resulted from milling about 150 tons, but that preliminary assays indicate the concentrate is of excellent grade.

» » » Lessees working in silver and gold properties in the Tonopah and adjacent districts say there is a growing demand for silicious ores, due to the fact that suspension of gold mining operations in the major districts of Nevada as well as other states has caused a shortage of materials used by smelters for fluxing purposes. Large amounts of silicious ore had been shipped from both the Tonopah and Goldfield districts before gold mining came under the ban. The American Smelting & Refining Company is offering a premium for silica rock containing 1.5 percent metal and 75 percent silica.

ARIZONA

» » » Small mine owners and operators in Arizona received \$1,331,300 in loans from the Federal Reconstruction Finance Corporation for the fiscal year 1942-43, covering 99 accessibility and 64 larger development requests, it is reported in the fourth annual report of the Arizona Department of Mineral Resources, made by J. S. Coupal, director. The total is in excess of the amount given to any other state, he said. The access road program carried out by the State De-



Camp of Pershing Quicksilver Mines, Pershing County, Nevada, about 30 miles east of Lovelock

partment originated 49 projects, of which 25 were approved and 14 completed by the close of the year, Coupal said. He predicted an expanded program in the present fiscal year from increased Federal appropriations.

Surveys made at request of the Federal Government concerned copper, lead, zinc, tungsten, vanadium, molybdenum, asbestos, manganese, quartz crystals, among the various metals and minerals in the state. Surveys were also made on the state's tin can supply necessary for leaching copper from dump and low grade ores; stockpile possibilities of metals, and the fluxing ore situation. Arizona led the nation's leading region in the industrial salvage effort by

scoring 158.3 percent on its salvage quota for 1942, Coupal reported.

» » » A unique proposal of the Phelps Dodge Corporation to acquire agricultural lands of the Roosevelt Water Conservation district on the Salt River and transport water for use of the company's mines at Morenci, was denied by the Salt River Valley Water Users Association.

It was the proposal of the mining company to take water out of the Black River on the Salt River watershed, and pump it some 50 miles to Morenci for industrial and community use. "Full protection of the water rights of the Salt River basin through

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all lawful means in preventing the diversion of any waters therefrom—" was the policy statement of governors of the Water Users Association in turning down the plan.

Proposed diversion of waters would be an encroachment upon the appropriated and developed water of the valley to another drainage basin—and such a diversion ultimately would destroy the means of livelihood, the homes, and investments of those dependent upon the water supply, it was said. Need of the water for new war industries of the Salt River valley, just as vital of those of the copper company, also was cited in the denial.

» » » Rulings in August of the Non-ferrous Metals Commission of the War Labor Board on applications for wage adjustments have concerned 1,500 Arizona miners, it is said. Affected are: the Christmas mine, Winkelman, 30 employees; Kennecott Copper (Ray and Hayden-Ray mines division), 884; Tennessee Schuylkill Corporation, Chloride, number of employees unannounced; and the Castle Dome Copper Company, Miami, 478.

» » » First challenge to new mines valuations fixed by the Arizona Tax Commission, was taken in mid-September by the Phelps Dodge Corporation in payment under protest of \$191,660.26 in taxes on the company's United Verde property in Yavapai County. The Yavapai County treasurer also notified the State Tax Commission that the mining company had filed appeal on the commission's valuation of the property at \$14,572,000.

» » » Fred Goodale is managing the Emerald Isle Copper Company's property four miles out of Chloride (Mohave County), and has reported that ore is being shipped directly to the smelter. More than 25 cars of lead-zinc ore had been shipped from the Manzanita property in Mohave County by mid-September, according to Russell Lord, manager.

» » » Two million dollars in war bonds were purchased in Arizona in the recent drive, by the Phelps Dodge Corporation, according to announcement by P. G. Beckett, vice president. The corporation made allocations to the various counties in proportion to their quotas, he said.

» » » Premium payments on metal production to mine operators having zero quotas will be speeded in a new plan announced in Arizona by Charles F. Willis, Phoenix, consultant for the Metals Reserve Company. Under the new plan, such operators will get an advance of 90 percent of their premium allowance



One of the more recent plants in the Coeur d'Alene region is that of the Coeur d'Alene Mines Corporation at Osborn. It has a capacity of 600 tons per day, recovering lead, silver, copper and antimony concentrates

at time of the ceiling price settlement on individual shipments from the mill, smelter, or processing plant, Willis said. Previous delays of from six weeks to two months often has held up further production, and has prevented expansion of operations, he said.

» » » The Mohave County Council of the Arizona Small Mine Operators Association has petitioned agencies in Washington, D. C., concerning themselves with metals production, urging changes in mining regulations to permit more rapid development of properties containing strategic minerals.

IDAHO

» » » Lucky Friday Silver Lead Mining Company, operating a new development almost within the city limits of Mullan, have received returns on a recent shipment of 58 tons of lead concentrates and 63 tons of zinc concentrates which netted the company \$15,495.49 without the premium payment on a zero rating basis. This is only one of several shipments netting similar returns from a shaft development that has reached a depth of 600 ft. During this work the company has produced and shipped ore to a total value of \$107,188.15. Only enough ore has been removed to pay expenses of development and equipment, including a \$15,000 purchase price for the property. The company is now making preparations to sink an additional 200 ft. to the 800 level. The mine is one of the "freak" developments of the Coeur d'Alene district. It is located between the Osborn and White Ledge faults, where few have ever looked for mines. It is being operated by a small stock company composed of local residents.

» » » The Hecla Mining Company has opened a body of zinc-lead ore 4 to 11 ft. wide and 800 ft. long at the Silver Cable mine, east of Mullan, and is shipping about 80 tons per day to the Hecla mill at Gem, necessitating a truck haul of 17 miles. Hecla has the Silver Cable under lease. Several other outfits have attempted to put the Silver Cable into production but all have met with failure because of lack of capital, milling facilities or low metal markets, or all three. The present ore showing and tonnage available for mining is much greater than anticipated. Some engineers describe the ore occurrence as an "upside down" ore body, showing a large tonnage within a few hundred feet of the surface and nothing in lower development. However, Coeur d'Alene district ore bodies have delivered many surprises to geologists and the Silver Cable may be one of them. At least, the present operators are considering plans to try out the vein system at greater depth.

» » » The Lead Crystals Mining Company, a Day organization, has opened a vein of high grade galena (lead-silver) ore in a lower tunnel driven during the last year. This is the fourth tunnel opening, all of which show commercial tonnages of high grade. The present strike shows about 2 to 3 ft. wide of high grade

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ore, much of it of crude shipping quality. The No. 4 tunnel, in which the strike was made, provides a depth of 315 ft. below the No. 3 opening. The property is located on the west fork of Eagle Creek in the Murray section and on the strike of the same mineral zone as the Jack Waite mine, which for several years has been producing high grade lead ore while under the operation management of the American Smelting & Refining Company.

» » » The Victory Metals Company is moving its 150-ton milling plant from Murray to Colville, Wash., where the company has purchased the Old Dominion mining property, a former lead, silver producer. Dominion ore is said to have contained a good percentage of zinc and the Victory Metals Company proposes to work over the old dumps and tailings piles for that metal while engaged in reopening the mine for further production. The company formerly operated the old Daddy gold mine at Murray, one of the first quartz mines in the camp, and later operated a lease on the Golden Chest mine.

» » » Hypotheek Mining & Milling Company, which from 1914 to 1927 produced 7,418 tons of lead-silver ore with smelter returns of \$475,273.85, is now making preparations to reopen the mine for new development work. The property is located near Kingston, several miles west of the Bunker Hill and Federal mines at Kellogg.

WASHINGTON

» » » The Federal Mining & Smelting Company, acting as agent for the American Smelting & Refining Company, is developing a tungsten property recently discovered in Ferry County, Wash., and on which A. S. & R. has taken a lease and bond for \$100,000. Federal will employ a crew of 10 or 12 men in development operations during the winter.

NEW MEXICO

» » » Speaking before the Interstate Oil Compact Commission, meeting September 25 at Santa Fe, State Geologist John Kelly in a nine-year description of the Hobbs, Eddy County oil field, declared it "the best managed competitive field in the United States," and added: "The Oil Conservation Commission of New Mexico has always enjoyed the fullest cooperation, both from the engineering standpoint and from the standpoint of enforcement of its regulations from all operators without exception. I believe this spirit of cooperation is the major factor in making Hobbs the best managed competitive oil field in the United States."

MONTANA

» » » A drilling program is under way on both Running Wolf and Sheep Creek iron ore deposits south of St. Paul, Mont. Four diamond-drill holes on the lower end of Running Wolf's deposit will test only the most accessible area of 4,500 ft., including three claims. The deposit is reported to be 6.2 miles long, but much of the terrain is very difficult. Bulldozers will be used to remove the overburden on the vein.

» » » Manganese production in the Philipsburg district is being maintained at capacity.

» » » There appears to be a growing interest in phosphate mining near Garrison, Mont. The Anderson phosphate mine near there has been reopened and production is resumed from the Lute mine, near Avon. Output from the latter property will be exported to Canada, where it is processed at the Trail smelter, British Columbia.

Silver

(Continued from page 23)

consumption was estimated at 121 million ounces, most of which was obtained from imports, or stocks held by the Treasury and those acquired by the Metals Reserve Company. In addition to industrial consumption, the Government consumed approximately 91 million ounces in the manufacture of subsidiary coins, which brings the total industrial and coinage consumption in the year 1942 to about 212 million ounces.

It has been estimated that the industrial consumption for 1943 (both for strategic and nonessential products) will be from 159 to 169 million ounces, including about 30 million ounces for nonessential purposes. If coinage requirements should be the same as in 1942, the total requirements for industrial use and coinage in the United States should be somewhere between 250 and 260 million ounces. In addition several million ounces of Treasury "free" silver will be shipped overseas for coinage and industrial purposes.

A higher price for foreign silver would serve to stimulate production in the silver-producing countries of this hemisphere, though it is improbable that even if our imports of silver do increase that this will offset any considerable part of the disparity between current requirements and current supplies—other than Treasury silver—in the United States. And there is little possibility of increasing our domestic production for the duration.

The black production outlook, however, is brightened considerably by

the existence of large stocks of silver in the hands of the Government. On July 15, 1943 the Treasury had 1,251 million ounces of "free" silver all of which has been earmarked for essential use, nonrecoverable or recoverable. Of its reserves of "free" silver, the Treasury has allocated one billion ounces to the Defense Plant Corporation for recoverable use in war industry, 700 million ounces of which are already in use. The balance of the stocks of "free" silver are available for other industrial uses, minting, or loan to other governments under the Lend-Lease Act.

The future holds many and varied opportunities for silver. Silver in industrial uses will assume a position of paramount importance in the post-war period. There will probably be a much larger demand for silver for electrical purposes and for bearings than even before the war. Many non-essential uses which were beginning before the war will be resumed, and the silverware industry will have accumulated a considerable backlog of orders which will require substantially larger supplies of silver than the pre-war average of about 30 million ounces annually.

From the foregoing facts it is obvious that the industrial demand for silver during the past few years has materially changed the course of the white metal, but its functions in the monetary systems of the post-war world will not lose importance as a result of this new role.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

OF THE MINING CONGRESS JOURNAL, published monthly at Washington, D. C., for October 1, 1943.

City of Washington, District of Columbia, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared B. E. Chambers, who, having been duly sworn according to law, deposes and says that she is the business manager of THE MINING CONGRESS JOURNAL, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor and business manager are:

Name of publisher, The American Mining Congress, Washington, D. C.

Editor, Harry C. Chellison, Washington, D. C.
Business manager, B. E. Chambers, Washington, D. C.

2. That the owners are: The American Mining Congress—a corporation, not for profit. No stockholders. President, Howard I. Young, St. Louis, Mo.; Secretary, Julian D. Conover, Washington, D. C.

3. That the known bondholders, mortgages, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

B. E. CHAMBERS,
Business Manager.

Sworn to and subscribed before me this 8th day of October, 1943.

ELSIE L. LEISHMAN,
Notary Public.

(My commission expires January 16, 1944.)

Manufacturers Forum

Faceshield

The M. S. A. Type "H" faceshield has been developed by the Mine Safety Appliances Company for quick attachment to the Type "K" M. S. A. skullgard protective hat.

The Type "H" faceshield, providing



durable and convenient protection for the face against flying particles, is readily assembled to "K" skullgards in the field, making possible easy adaption to the many skullgards now in service.

Positive attachment is said to be assured and the faceshield can be removed just as quickly as it can be attached, thus permitting the use of the skullgard alone at any time.

Clear, transparent visors, 14 in. wide by 6 in. long, of the best commercially available plastic, are employed. The visors are fastened to the combination unit in a novel but very practical manner, affording a simple and easy means of replacement. Visors are interchangeable.

The fibre visor retaining strap is mounted on a pivotal joint, allowing upward or downward movement of the faceshield to the position desired by the operator.

Self-priming Pump

An improved automatically controlled valve is a distinctive feature of the new Type AO self-priming pump announced by Allis-Chalmers Manufacturing Company, Milwaukee, Wis. The design and operation of its valve arrangement is an important factor in the quick and effective self-priming action of this pump.

Priming is accomplished as the

motion of the water throughout the pump runner and the volute passage carries behind it a slug of air, drawing air in the suction passage through the impeller and out through the priming chamber. This hydraulic action lifts the column of water in the suction line and achieves the same results as would a separate vacuum pump. The priming valve closes slowly during this process, acting against a spring tension which governs the rate of priming and the static height of the priming suction lift. The automatic closing of the valve after complete priming prevents water from bypassing back to the suction chamber, with resultant power loss.

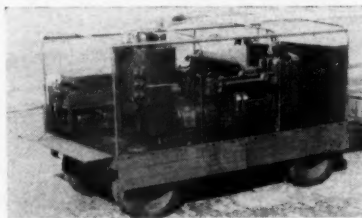
The pump impeller has an unusually thick vane with rounded inlet edges, permitting the pump to pass stringy materials and fairly large solids.

Oil Reclaiming Trailer Unit

The Youngstown Miller Company, of Sandusky, Ohio, has designed, built and delivered to a division of the armed forces a mobile lubricating oil reclaimer. Mounted on the trailer is a standard type Y-M reclaimer, a Diesel electric generating set, clean oil storage tank, fuel oil tank, and waterproof storage bins for refinery earths, filter papers, and spares.

In operation, a charging pump conveys the dirty oil from drums on the ground to the heating tank, where it is brought to a sufficient temperature in intimate contact with refinery earth to dissipate the volatiles.

The heating process is controlled by thermostats, and when the proper temperature is reached the oil is dropped into a transfer tank, then



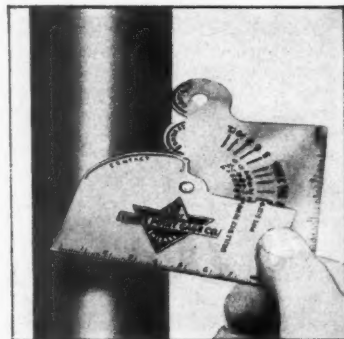
forced through a two-stage filter by compressed air and out to clean oil receiving drums.

The reclaimers are built in eight sizes to meet any requirements for the purification of dirty lubricating oils from Diesel, automotive, and aircraft engines, as well as for hydraulic, vacuum pump, and transformer oils.

The reclaimer is of the contact earth filtration type, utilizing common refinery earths available on the open market, and is said to be designed to remove non-lubricating volatiles by slow heating; solid and asphaltic materials by filtering; and is said to be capable of removing fuel dilution, water, acids, solids, and colloidal carbon, dirt, and the like, thus restoring the used oils to substantially the same values of fire, flash, viscosity, color, neutralization number, precipitation number as the new or parent oil.

Size of Pipes Quickly Measured

A new pocket size, three-point pipe gage for quick measurement of all sizes of pipe from $\frac{1}{4}$ in. to 12 in., is announced by the Three-Point Gage Company, 3821 Broadway, Chicago, Ill.



This gage consists of two pivoted steel plates with edges curved at three points for contact with the pipe to be measured, together with scale which automatically registers not only the pipe size in terms of inside diameter but the drill size for tapping.

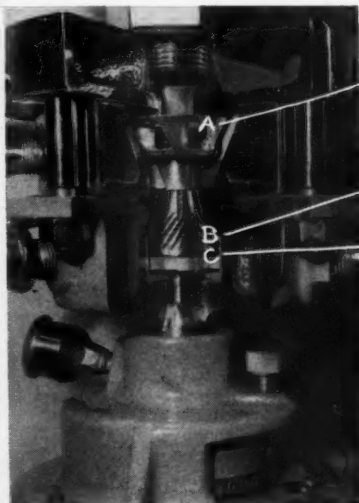
The gage measures the outside arc of the pipe at three points of contact, and that, by placing the two fixed contact points of one plate against the outer contour of the pipe and sliding the second or moveable plate until it makes the third contact, the marker on face of the gage will show the size of the pipe and also the correct drill size for tapping.

An additional advantage claimed for this new gage is that it is necessary to contact only a small section of the pipe contour and that it will measure pipe in any position, even against the wall or in a corner, and will measure a covered pipe if there is a small opening near a union or other fitting where the gage may be slipped in. The gage is constructed

of steel with deep etched numerals, and the size when closed is only 2½ x 4¼ in.

Mill for Pulverizing Coal

The Eppenbach colloid mill, manufactured by the Eppenbach Machinery Corporation, Long Island City, New York, is a unit for making so-called colloidal fuel. Mills are now manufactured with a 50-ton per hour capacity and require a total of 15 hp.



Courtesy of Colloidal Oil Corporation

per ton. The Eppenbach mill illustrated below is fed with 30-mesh bituminous coal dust with Bunker "C" oil, and the mixture, 50-50 by weight, flows into a reservoir and then into a high-pressure rotary pump that delivers it at 225 to 400 psi. into the mill, from which it flows at a temperature of about 400° F.

The unit subjects the material to three distinct actions. First, the top turbine "A" whirls it violently and the high-velocity impact breaks up the liquid into minute globules. Second, the material is mechanically sheared by the teeth "B" in the rotor and stator; and third, it is hydraulically sheared by the final smooth surfaces "C" of the rotor and stator. The particle size is controlled by the size of the gap "C," which is regulated by a micrometer adjustment device, at one one-thousandth to one two-thousandths of an inch.

Combination Switch

The Mosebach Electric & Supply Company, 1152 Arlington Ave., Pittsburgh 3, Pa., has recently perfected a combination trolley single or double feeder switch of the reversible type. It employs two ¼ x 1½-in. bus bar copper blades hinged on the insulated wood block of the switch, and is

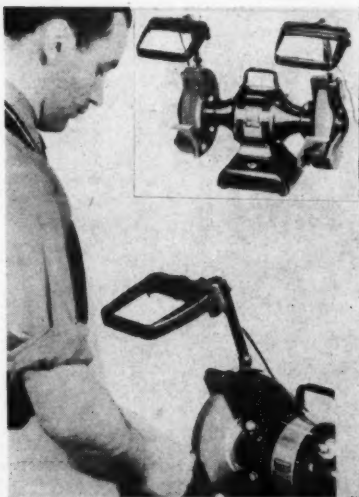


equipped with a single or double feeder clamp connection which is easily installed and removed.

This new trolley feeder switch has double, insulated suspensions and a knife edge approach to insure a smooth underrun. For safe manipulation and application, the switch incorporates a soft rubber handle, with a fibre guard, and the blades have dowel holes for lockage in the open position.

Grinding Shield

With a completely redesigned frame molded from a high impact resisting, plastic material, electrical parts in a completely insulated chamber and mounted on an adjustable bracket, the Boyer-Campbell Company, 6540 Antoine Street, Detroit, announces a new model of Marvel grinder shield that provides properly directed light and protection for the face and eyes from flying particles. Light (push-button switch) is focused right on the



work. The better visibility not only accounts for more rapid and accurate work but tends to avoid injury to the hands. The window is of non-shatterable glass and the lamps, of the bayonet type, are vibration resisting and are set in flush with the frame.

Lifting Magnets

The Stearns Magnetic Mfg. Co., Milwaukee, Wis., announces a complete line of lifting magnets to supplement its present complement of magnetic separators, suspended magnets, and rectangular lifting magnets.

The Stearns circular lifting magnets are announced in the following specifications:

Size, in.	Average amps at 230 volts	Weight, lb.
20.....	2.3	450
25.....	6.8	875
30.....	9	1,300
40.....	17	2,400
45.....	32	3,800
55.....	40	5,900
65.....	58	8,900

Features of the manufacturer's circular lifting magnet include renewable pole shoes of selected alloy steel; ribbed coil shield; uncoil construction; excellent heat dissipation; better coil weight support to hold coil securely; leads and terminals fully protected against damage and shock; readily accessible for inspection without disturbing the insulation, which is permanently sealed; windings vacuum impregnated to eliminate possibility of electrical trouble and waterproof construction.

CATALOGS AND BULLETINS

BALL BEARINGS. *Marlin-Rockwell Corp.*, Jamestown, N. Y. Bulletin No. 26 contains a list of bearing numbers of over 12,000 different ball bearings made by the various American ball bearing manufacturers. This bulletin is intended to be of help to the shop man in making ball bearing service replacements. 28 pp.

COLORTHRU. *Colorthru Chemicals*, 20 West 45th St., New York, N. Y. The company has issued a folder which describes features of a paint which causes a chemical reaction that solidifies the various component parts of masonry into one single solid mass. It is said to stop dusting, cracking, crumbling and to prevent seepage.

COPPER AND BRASS IN THE WAR. *Copper and Brass Research Assn.*, 420 Lexington Ave., New York, N. Y. Bulletin No. 125 is an interesting pictorial presentation of the many uses of copper and brass in the war program. 36 pp.

CRISIS IN RUBBER. *The B. F. Goodrich Co.*, Akron, Ohio, announces a booklet with this title which is offered as a scientific discussion on the chemical structure of rubber and reviews the status of natural and synthetic rubber.

JACK MAINTENANCE MANUAL. *Duff-Norton Manufacturing Co.*, Pittsburgh, Pa. The company has issued a bulletin entitled "Maintenance and Safety Hints," designed for users of mechanical lifting jacks. A special section is devoted to the maintenance problem in industrial plants and mines. 16 pp.

REFRACTORIES. *Basco Refractories, Inc.*, Cleveland, Ohio. Bulletin 210 R describes and illustrates applications of the manufacturer's refractory for basic open-hearth furnaces.

SCREEN FILTER SEPARATOR. *The Stearns Magnetic Mfg. Co.*, Milwaukee, Wis. Bulletin No. 120 describes and illustrates the manufacturer's Type "QS" screen filter separator.

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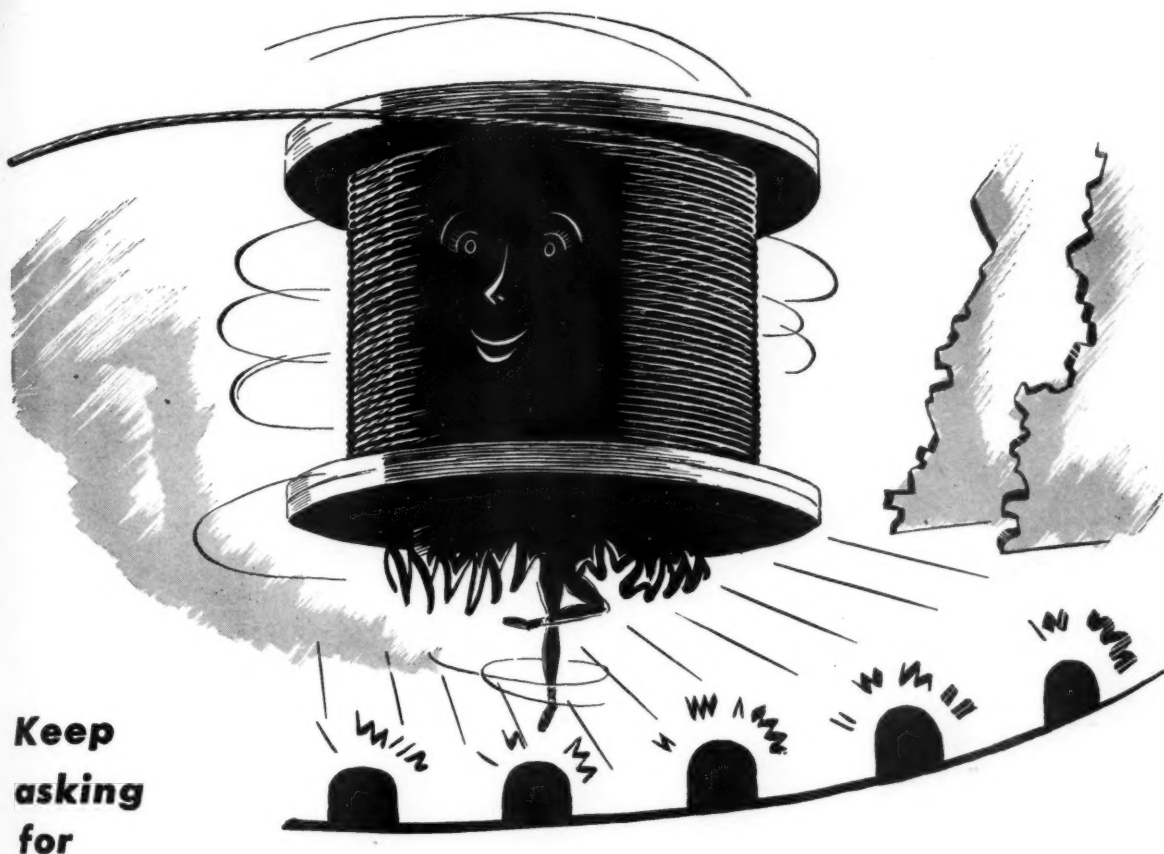
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